APPENDIX A

Notice of Preparation

San Francisco Planning
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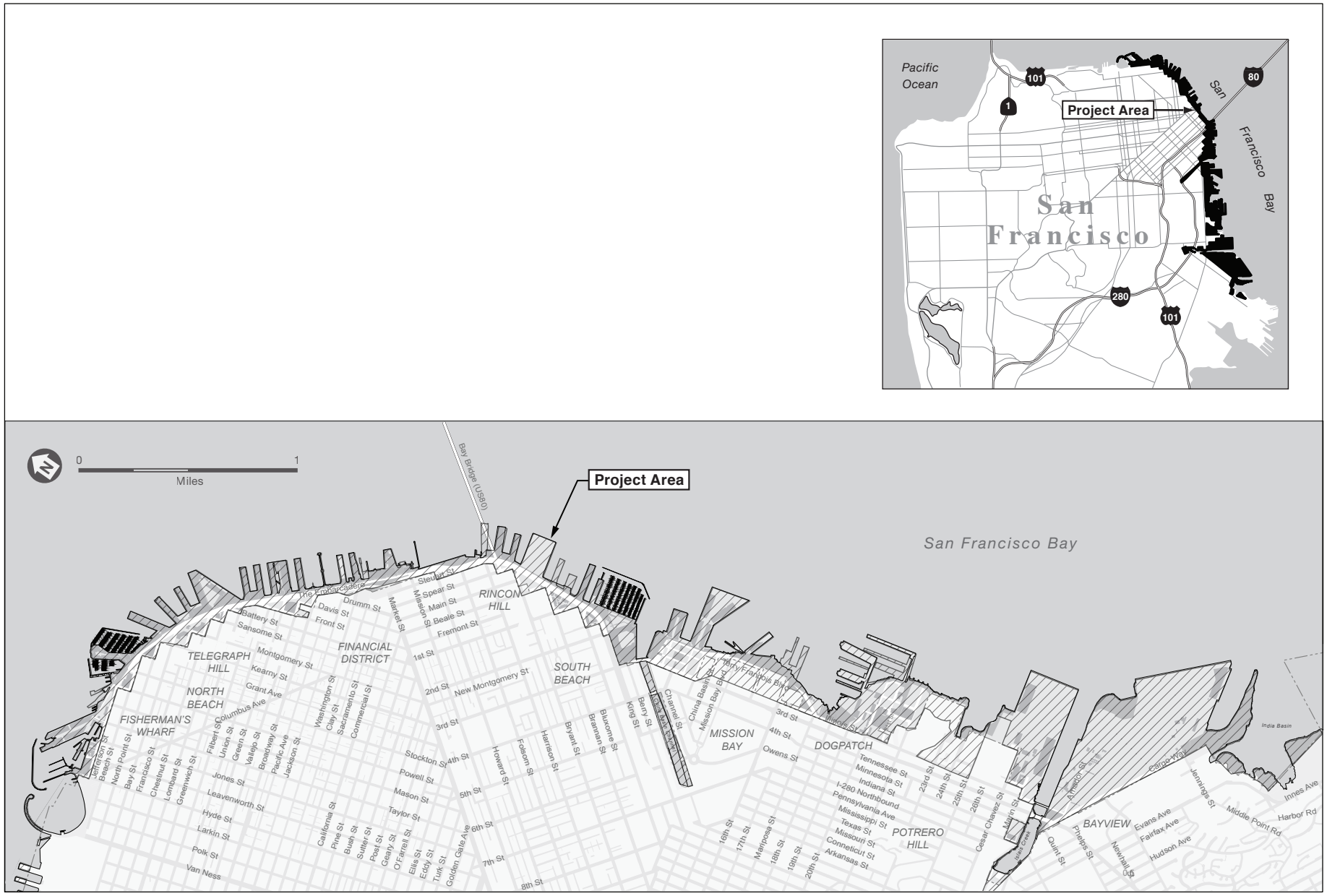
PUBLIC NOTICE
Availability of Notice of Preparation of an Environmental Impact Report and Notice of a Public Scoping Meeting

Date:	August 26, 2020
Case No.:	2019-023037ENV
Project Title:	Waterfront Plan Project
Block/Lot:	Multiple Piers and Seawall Lots
Project Sponsor:	Diane Oshima—Port of San Francisco 415.274.0553 diane.oshima@sfport.com
Staff Contact:	Sherie George – 628.652.7558 CPC.WaterfrontEIR@sfgov.org

The San Francisco Planning Department has prepared this notice of preparation of an environmental impact report (EIR) in connection with the Waterfront Plan Project. The purpose of the EIR is to provide information about the potential significant physical environmental effects of the proposed project, to identify possible ways to minimize any potentially significant adverse effects, and to describe and analyze possible alternatives to the proposed project. The planning department is issuing this notice to inform the public and responsible and interested agencies about the proposed project and the intent to prepare an EIR, including a public scoping meeting to solicit comments on the scope of the EIR. The planning department will hold the public scoping meeting on Wednesday September 9, 2020, starting at 5 p.m. The planning department will hold the meeting using an online platform. You can view this notice and join the meeting via the online platform link found on the planning department's webpage, http://www.sf-planning.org/sfceqadocs; or via phone, using the following phone number and meeting identification number: 833.548.0282 (Toll Free); meeting ID 831 0306 4931.

Project Summary

The proposed Port of San Francisco 2019 Waterfront Plan Project (2019 Plan or proposed project) would update and amend the 1997 Waterfront Land Use Plan (1997 Plan), which sets long-term goals and policies to guide the use, management, and improvement of 7.5 miles of properties under the Port's jurisdiction, from Fisherman's Wharf to India Basin (see Figure 1, Project Location Map). The Port of San Francisco (Port) developed the 1997 Plan pursuant to Proposition H, approved by San Francisco voters in 1990, and the Port Commission adopted it in 1997. The goals and policies in the 1997 Plan have guided the development of new parks, maritime facilities, historic rehabilitation, and development projects on Port properties.



SOURCE: Port of San Francisco, Waterfront Plan, June 2019

Waterfront Plan Update

Figure 1
Project Location Map

In 2015, the Port conducted a comprehensive review and identified changes in conditions and the need to update the 1997 Plan. This led to a three-year public planning process led by a Waterfront Plan Working Group, which produced policy recommendations to be reflected in the updated Plan. In June 2019, the Port published the Draft Waterfront Plan for Public Review and Comment (2019 Plan), which incorporates those policy recommendations along with other updates to recognize and align with City policies, evolving public trust needs, and land use changes on Port property. The 2019 Plan provides a long-range policy framework to guide future Port improvement projects, programs, and stewardship initiatives.

Future improvements along the Port's waterfront would be guided by nine goals and policies that provide direction for managing and improving the waterfront throughout its jurisdiction. Goals and policies include but are not limited to preservation and enhancement of the waterfront's function as a maritime port, hosting a diversity of activities and people, enhancing public access and open space along the waterfront, the design of quality new development and preservation of the waterfront's historic character, strengthening the Port's resilience to climate change impacts, and cultivating an environmentally sustainable port to limit the impacts of climate change.

The IS and EIR will study the 2019 Plan at a programmatic level of review. A programmatic analysis is appropriate for a project that involves a series of actions that are (1) related geographically; (2) logical parts in a chain of contemplated actions; (3) connected as part of a continuing program; and (4) carried out under the same authorizing statute or regulatory authority, with similar environmental impacts that can be mitigated in similar ways (California Environmental Quality Act [CEQA] Guidelines section 15168). CEQA Guidelines section 15168 notes that the use of a programmatic analysis can "ensure consideration of cumulative impacts that might be slighted in a case-by-case analysis; avoid duplicative reconsideration of basic policy considerations; allow the lead agency to consider broad policy alternatives and program-wide mitigation measures at an early time, when the agency has greater flexibility to deal with basic problems or cumulative impacts; and allow for a reduction in paperwork."

Project Location and Site Characteristics

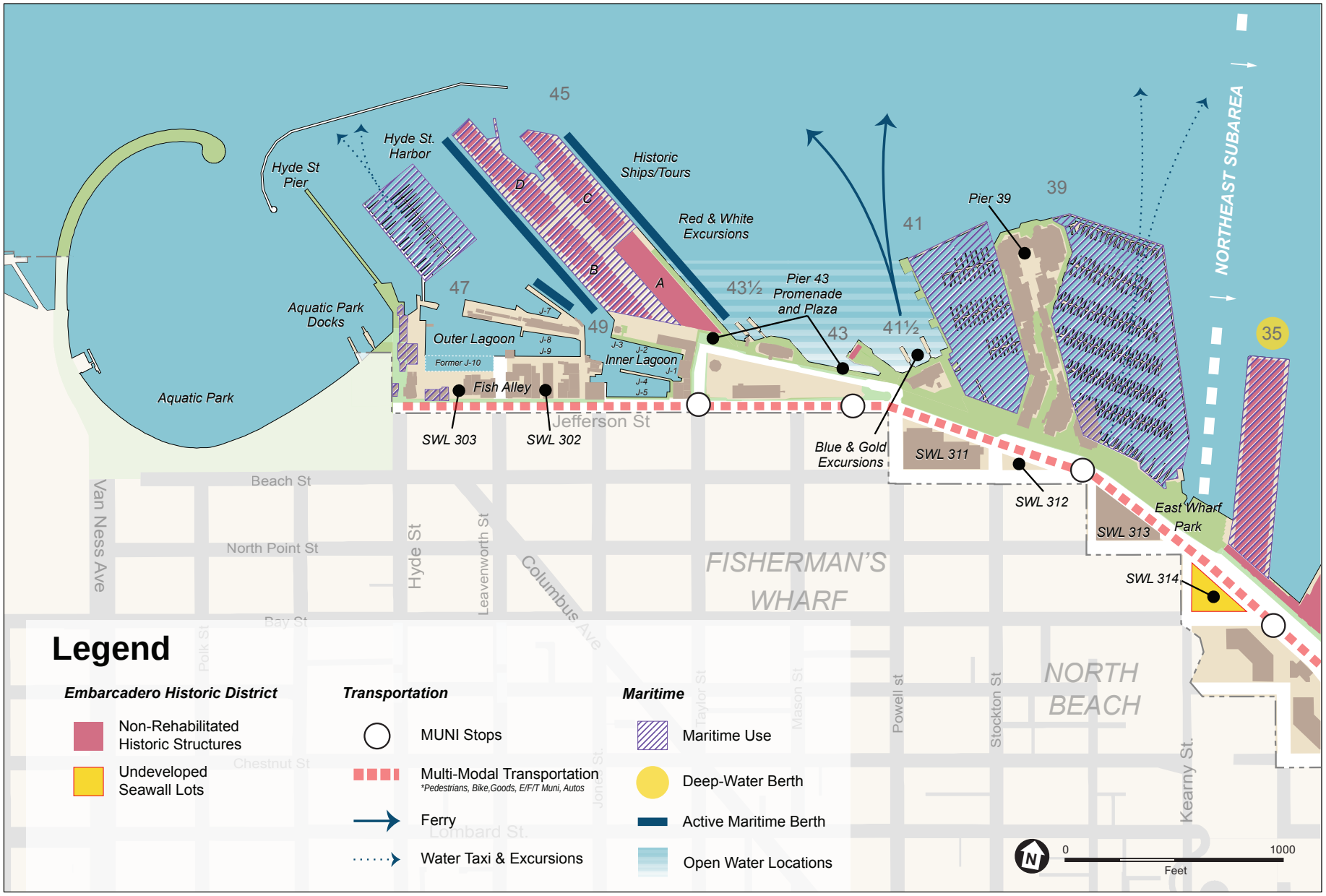
The Port of San Francisco's waterfront lies within the Port's 7.5-mile jurisdiction, a continuous shoreline from the curved, northeast shore adjacent to Aquatic Park in Fisherman's Wharf to Heron's Head Park near India Basin in the southeast (see Figure 1). The waterfront is bounded to the north by the Russian Hill and North Beach neighborhoods and to the south by the Bayview and India Basin neighborhoods. The 2019 Plan divides the waterfront into the northern waterfront and southern waterfront with five subareas described below.

The Northern Waterfront Subareas

The three Northern Waterfront subareas: Fisherman's Wharf, Northeast Waterfront, and South Beach share a similar architectural character and land use history. The historic finger piers and bulkhead buildings of the Embarcadero Historic District are defining elements that span all three subareas. The subareas in the Northern Waterfront are made up of a transportation network and a pedestrian walkway that begins along Jefferson Street in Fisherman's Wharf and ends at the San Francisco Giants ballpark in South Beach.

Fisherman's Wharf

Fisherman's Wharf extends from the east end of Aquatic Park to the east side of Pier 39, an area of shoreline located roughly between Hyde and Kearny streets (see Figure 2, Fisherman's Wharf Subarea). Roadways in the vicinity that provide access to Aquatic Park, include north–south roadways, Van Ness Avenue and Hyde Street,



SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 2
Fisherman's Wharf Subarea

and the east–west Jefferson Street. Pier 39 is accessible via the north–south roadways, Powell and Stockton streets, and along The Embarcadero. There are a number of public transit lines that provide access to the subarea, including the San Francisco Municipal Railway (Muni) E/F Embarcadero and Market & Wharves line along The Embarcadero and Jefferson Street, the Muni Powell/Hyde Cable Car line, and bus routes 19 Polk, 30 Marina, 47 Van Ness, and 39 Coit. Water transportation is provided to Fisherman's Wharf by water taxi service at Hyde Street Fishing Harbor and 39, and by ferry service at Piers 41 and 43½.

The types of uses in Fisherman's Wharf include commercial and industrial fishing and fish processing, commercial uses, and recreational uses including recreational boating. This section of the waterfront supports the largest fishing industry center along the west coast as well as a tourist and recreational destination that has significant pedestrian activity because of the historical ships, ferry and water taxis providing transportation, and restaurants and other historical attractions along the Wharf.

The Port's piers and seawall lots in the Fisherman's Wharf subarea are located within two zoning districts, Public (P) and Community Business (C-2), and some seawall lots in C-2 that are also within the Waterfront Special Use Districts (SUD) 1 and 2.

Northeast Waterfront

The Northeast Waterfront extends from Pier 35 to Pier 14 along The Embarcadero, an area located roughly between Kearny Street to the north of The Embarcadero and Howard Street to the south (see Figure 3, Northeast Waterfront Subarea). Major roadways that provide access to the subarea include Bay, Broadway and Market streets, all of which intersect The Embarcadero. Public transit in the subarea is served by Muni E/F Embarcadero and Market & Wharves line along The Embarcadero; light rail lines J, K, L, M, N, and T; and bus routes 1 California, 6 Haight/Parnassus, 8 Bayshore, 7X Noriega Express, 14 Mission, 14X Mission Express, 21 Hayes, 31 Balboa, 39 Coit, and 82X Levi Plaza Express. Water transportation is provided to the Northeast Waterfront by water taxi service between Piers 9 and 15, and by ferry service at the Ferry Building.

The Northeast Waterfront is part of a former maritime and industrial district that has evolved into an urban neighborhood. Though cargo activities continue to consolidate in the Southern Waterfront, the Northeast subarea still maintains the Port's cruise operations at the Pier 27 James R. Herman Cruise Terminal and at Pier 35, layberths (temporary berths). It supports a wide variety of vessels, supports harbor services including bar pilots and tug and tow operations, as well as the Downtown Ferry Terminal and Water Taxi transportation services. The Ferry Building, Piers 1 to 5 and Pier 15 are Embarcadero Historic District resources that have been rehabilitated

for commercial, recreational, and maritime uses. Parks and open spaces in this subarea include Pier 27 Cruise Terminal Park and public Piers 7 and 14.

The Port's piers and seawall lots in the Northeast Waterfront are located within three zoning districts—Public (P), Light Industrial (M-1), and Community Business (C-2). In addition, pier facilities in this subarea are within Waterfront SUD 1, and Port-owned seawall lots are within Waterfront SUD 3.

South Beach

The South Beach subarea extends from Rincon Park to the Giants ballpark. South Beach is an area of the Port that is located roughly between Howard Street to the north and Third Street to the south (see Figure 4, South Beach Subarea). Major roadways in the subarea include Howard, Harrison, Bryant, and Brannan streets, which intersect

SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 3
Northeast Waterfront Subarea

SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 4
South Beach Subarea

with The Embarcadero, and Second and Third streets, which intersect with King Street by the ballpark. Public transit in the subarea is served by Muni light rail lines N and T, along with bus routes 10 Townsend, 30 Stockton, 30X Marina Express, 45 Union/Stockton, and 82X Levi Plaza Express. Water transportation is provided to South Beach by water taxi service between Piers 28 and 40, and by ferry service at the China Basin Ferry Landing.

A formerly industrial district, the South Beach section of the Port's waterfront is dominated by mixed-use residential and commercial neighborhoods, but it still functions as a site for maritime support uses. Fire boats and emergency service operations are located at Pier 22½; other piers support vessel layberthing; and South Beach Harbor supports a 700-berth marina, water recreation, and water transportation services. A section of waterfront much like the Northeast Waterfront and Fisherman's Wharf, it is a destination for excursion and recreational boating and water recreation. Parks and open spaces in this subarea include Rincon Park, Brannan Street Wharf, South Beach Park, and Ballpark PortWalk along the San Francisco Giants ballpark.

The Port piers and seawall lots in South Beach are located within three zoning districts—Public (P), Light Industrial (M-1), and Community Business (C-2). Pier facilities are within Waterfront SUD 1, and Port-owned seawall lots in this subarea are within Waterfront SUD 3.

The Southern Waterfront Subareas

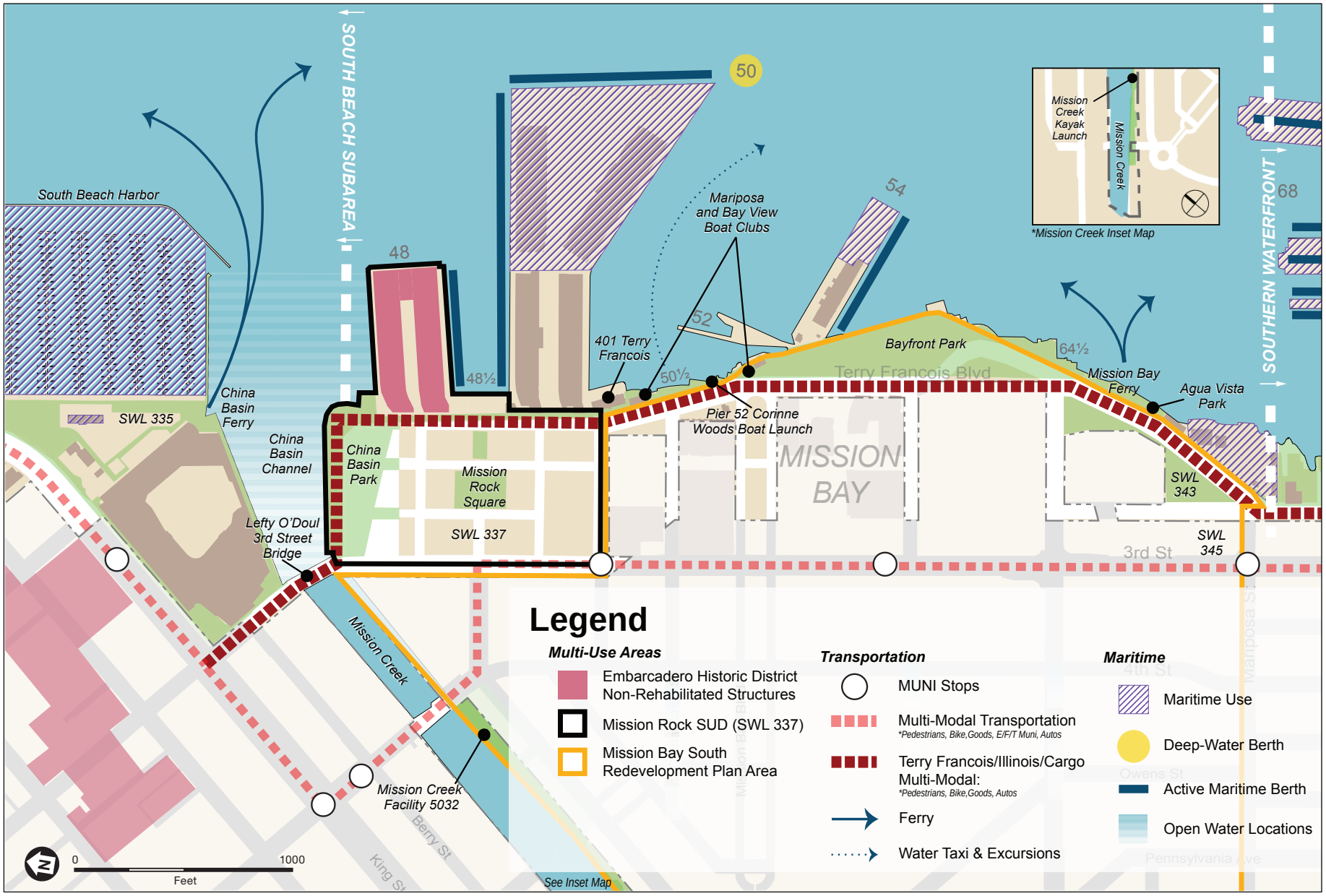
The two Southern Waterfront subareas, Mission Bay and Southern Waterfront, are within the Blue Greenway network of public access, habitat restoration, and water recreation facilities, which begins at the foot of the Lefty O'Doul Third Street Bridge and extends through the Mission Bay and Southern Waterfront subareas to India Basin. The Southern Waterfront subareas include waterfront parks; direct shoreline access to the Bay; new mixed-use neighborhoods; commercial, residential, and recreational uses; and light-industrial activities including the Port's cargo shipping and industrial maritime uses.

Mission Bay

Mission Bay extends from China Basin Channel to the north to Mariposa Street at the southern end of the subarea (see Figure 5, Mission Bay Subarea). The Mission Bay South Redevelopment Plan area has been developed by the City, converting former railyards and industrial lands into a new neighborhood with the University of California, San Francisco (UCSF) Mission Bay campus, hospital, biotechnology, commercial, and residential developments, and the Chase Center and Warriors basketball arena complex. Port properties in the Mission Bay subarea adjacent to this redevelopment area include China Basin and Bayfront parks, Pier 52 Public Boat Launch,

and the Terry Francois Boulevard public realm, all planned in concert with Mission Bay redevelopment and the Mission Rock SUD on Port-owned Seawall Lot 337.[1] The Mission Bay subarea also includes Pier 48 and Pier 50, which includes the Port's Maintenance Center, and supports harbor service and light-industrial tenants, and layberthing of U.S. Maritime Administration vessels. Park, commercial and maritime boatyard uses occupy Port properties at the south end of the Mission Bay subarea.

[1] The Mission Rock SUD includes a multi-phase, mixed-use development approved by the City that was analyzed in the Seawall Lot 337 and Pier 48 Mixed-Use Project FEIR, certified on October 5, 2017 (Case No. 2013.0208E). This document (and all other documents cited in this NOP, unless otherwise noted) is available for review on the following website: https://sfplanning.org/resource/permits-my-neighborhood. Individual files related to environmental review can be accessed by entering project address into the search box, clicking on the blue dot on the project site, and clicking on the "Documents" button under the ENV application number on the right side of the screen. Project application materials can be viewed by clicking on the "Documents" button under the PRJ case number. The "Filters" function can be used to search by case number.



SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 5
Mission Bay Subarea

Major roadways in the subarea include Terry Francois Boulevard along the waterfront and Third, 16th, and Mariposa streets. Public transit in the subarea is served by Muni light rail T line, along with bus routes 8BX Bayshore B Express, 14X Mission Express, and 55 16th Street.

The Port piers and seawall lots in Mission Bay are located within four zoning districts—Public (P), Mission Bay Redevelopment (MB-RA), Mission Rock SUD and Mixed Use (MR-MU), and Heavy Industrial (M-2). Seawall Lot 337 is located within the Mission Bay Redevelopment (MB-RA), Mission Rock SUD, and Mixed Use (MB-MU) zoning districts.

Southern Waterfront

The Southern Waterfront extends from Pier 70 to India Basin, and is located roughly between Mariposa Street and Hunters Point Boulevard (see **Figure 6, Southern Waterfront Subarea**). The Southern Waterfront subarea includes a mix of activities, including the Pier 70 SUD and 20th Street Historic Core rehabilitation project to support commercial, residential, and industrial/Production, Distribution and Repair (PDR) uses, Blue Greenway parks, and the Port's cargo and industrial operations.[2] Other maritime support uses, including harbor services and layberths, are sited in this subarea. Industrial activity in this area is also interspersed with natural habitat, habitat restoration, public access, and water recreation areas.

Major roadways in the subarea include Third, Mariposa, Illinois, 20th, 22nd, 24th, 25th, and Cesar Chavez streets, Cargo Way, and Evans Avenue. Public transit in the subarea is served by Muni light rail T line, along with bus routes 19 Polk, 22 Fillmore, 44 O'Shaughnessy, 48 Quintara/24th Street, and 54 Felton. Parks and open spaces in this subarea include China Basin and Bayfront parks, and the Terry Francois Boulevard public realm, Crane Cove Park, Warm Water Cove, Bayview Gateway, and Herons Head Park and EcoCenter.

The Port piers and seawall lots in the Southern Waterfront are located within the Heavy Industrial (M-2) zoning district, and Pier 70 and associated seawall lots are within the Pier 70 SUD.

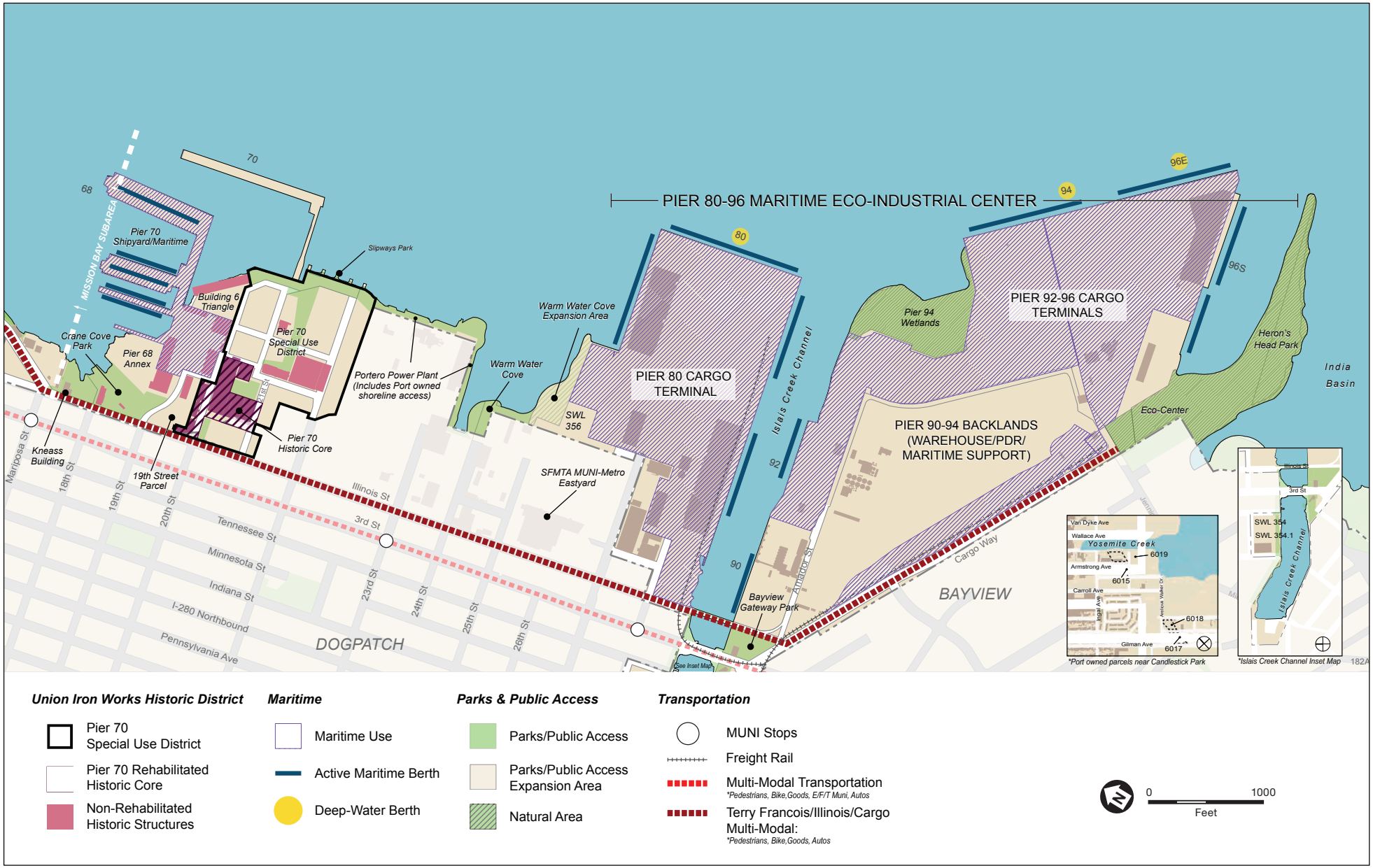
Project Description

The 2019 Waterfront Plan Update

The 2019 Plan provides goals, policies, and objectives for the five geographic subareas of the waterfront. The Plan proposes nine Port-wide goals, each of which is supported by policies. Four of these goals are new, and many policies in all nine goal categories are new or have been updated form the 1997 Plan.

Under the proposed project, the Port would expand the Waterfront SUD 1 (piers) and Waterfront SUD 3 (landside) districts, which establish design review procedures for major non-maritime Port development projects, to apply to Port piers and seawall lots located south of China Basin Channel that are not included in the Mission Rock or Pier 70 SUDs; currently, Waterfront SUDs 1 and 3 design review procedures apply only to Port properties north of China Basin Channel. The underlying zoning of allowable uses for those piers and seawall lots would remain the same.

[2] The Pier 70 SUD includes a multi-phase, mixed-use development approved by the City that was analyzed in the Pier 70 Mixed-Use District Project FEIR, certified on August 24, 2017 (Case No. 2014.001272ENV).



SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 6
Southern Waterfront Subarea

Waterfront Goals and Policies

Maritime

The maritime goal remains the same in the 2019 Plan—to recognize and support the current and future needs of the diverse categories of maritime industry and businesses at the Port. The updated or new maritime policies would continue to give priority to terminal, facility, berthing, and operational needs by allowing the Port to use any of its properties for maritime -related purposes, including Harbor Services and the Port's Maintenance Division facilities, which is consistent with the Proposition H requirement to give priority consideration to maritime needs. The 2019 Plan also continues to retain policies that support linking the development of new maritime facilities and improvements with complementary non-maritime mixed use developments and projects.

The 2019 Plan includes updated or new maritime policies in the following areas:[3]

1. Conducting site and financial feasibility studies to identify viable location(s) to develop a second cruise ship berth that complies with new air emission rules set by the California Air Resources Board (CARB) (Policies 9, 10);
2. Increasing coordination and partnerships to expand water transportation facilities and services (Policy 13);
3. Pursuing industrial leasing and warehouse development in the Piers 90–94 Backlands, and industrial transportation access to protect the integrity of the Port's Southern Waterfront cargo terminal operations (Policies 15, 16, 17);
4. Planning and providing water recreation facilities, partnerships, and related commercial services that are appropriately funded, located, and managed to be compatible with maritime and deep vessel operations, and sensitive natural habitat areas (Policies 19, 20, 21, 22, 23, 24, 25); and
5. Promoting shared public access on pier aprons where it is safe and compatible with maritime berthing, particularly in The Embarcadero Historic District (Policies 26, 27).

Diversity of Activities and People

This goal remains the same in the 2019 Plan—to promote a mix of commercial, industrial, public-oriented, civic, cultural, open space, and recreational uses that complement Port maritime activities. New information updates describe state trust legislation that has allowed development of non-trust uses on specified seawall lots, and recognition of the Pier 70 and Mission Rock SUDs, which are incorporated by reference in the 2019 Plan and supported by Development Agreements and Design for Development Documents, which secured City approvals following the completion of earlier CEQA environmental review processes.

The 2019 Plan includes updated or new policies in the following areas:

1. Promoting diversity of public-oriented uses that equitably serve and attract visitors of all ages, races, income levels, and abilities; increased number of free or low-cost activities; activities that promote connections to nature, maritime features, and public education (Policies 1–10);
2. Consistent with Maritime policies, supporting industrial warehouse developments in the Piers 90–94 Backlands area to complement and support maritime terminal operations in the Southern Waterfront (Policy 13);

[3] The citations shown in parentheses after the stated policy correspond to the policies identified in the Waterfront Plan listed under each goal.

3. Promoting a greater range of land uses and defined public trust objectives to increase certainty and financial viability of historic pier repair and rehabilitation projects in The Embarcadero Historic District, including requirements that all improvements be consistent with the Secretary of the Interior's Standards for Rehabilitation, and to include flood protection measures (Policies 23–33);
4. Promoting development of upland seawall lots to complement surrounding neighborhoods, enhance the public realm and connections to the Bay, with provisions that allow the Port under certain conditions to seek state legislation to allow non-trust uses on seawall lots north of Market Street (Policies 34–41);
5. Recognizing parking on seawall lots as a trust use by accommodating Port visitors who drive from elsewhere in the region or state, and Port businesses that are underserved by public transit; revenue generated from interim parking lots also are recognized as trust benefits (Policy 44); and
6. Updates to definitions and provisions for leases for interim uses for up to 10-year terms (Policies 50–52).

Public Access and Open Space

This goal is updated in the 2019 Plan to recognize an expanded network of public access and open space that extends along the Port's entire 7.5-mile waterfront, including the Blue Greenway open space system extending from China Basin Channel to Heron's Head Park. This open space network and updated policies support and recognize the Association of Bay Area Governments (ABAG) Bay Trail, and includes water recreation facilities which also implement the ABAG Bay Water Trail.

The 2019 Plan includes updated or new policies in the following areas:

1. Promoting ways to create and improve the public realm, and connections between the city, waterfront, and the Bay (Policies 2–3, 11);
2. Improvements to complete and enhance the Port's open space network by increasing the recreational uses, no/low cost activities and events, and connections with nature; and creating an improved Ferry Plaza on the bay side of the Ferry Building (Policies 4–6);
3. New park activation policies to support open space programs and improvements to serve a balance of local and state public trust needs, as well as people of all ages, races and economic means (Policy 8);
4. New policies to promote city and community partnerships to increase use and funding opportunities for waterfront parks (Policies 9–10);
5. New policy to recognize and describe ways to incorporate Bayside History Walk public access within Embarcadero Historic District pier projects (Policy 12);
6. Promoting connections with nature, and improvements of natural and marine habitat areas (Policy 17);
7. Promoting the Bay Water Trail, enhance water recreation facilities, and safe access in areas shared with maritime vessel operations and natural habitat areas (Policy 18);
8. Promoting compatibility and balance of public access and maritime berthing needs (Policy 19);
9. Directing development of design guidelines providing location criteria, materials, and furnishing design details to the enhance public access area, which aligns with San Francisco Urban Design Guidelines and Better Streets Guidelines (Policy 20); and
10. Promoting resilient landscape designs that adapt to sea level rise, preserve natural shoreline edges, and incorporate open space areas in plans for emergency staging and disaster response (Policies 21–27).

Urban Design and Historic Preservation

This goal and policies in the 2019 Plan describe city pattern, urban design characteristics, public views, architectural and historic resources, and principles and criteria to support new additions that respect and enhance maritime character and form along the Port waterfront.

The 2019 Plan includes updated or new policies in the following areas:

1. Enhancing the Piers 80–96 Maritime Eco-industrial district to allow industrial development while incorporating environmental improvements in the southern waterfront (Policy 3);
2. Recognizing the Embarcadero Historic District and Pier 70 Union Iron Works Historic District, and requirements for repair or rehabilitation of historic resources to be consistent with the Secretary of the Interior's Standards for Rehabilitation (Policy 4a);
3. Promoting historic resource stewardship through a variety of partnerships, funding and leasing strategies, and cultural programs that promote public awareness of Port maritime history (Policies 4b–4i);
4. Provide unifying elements to the length of Port property that strengthen the identity of the Port and enhance the public realm (Policies 5a–5g);
5. Integrating protection of historic and cultural assets with resilience planning (Policies 6a–6d); and
6. Producing design guidelines and criteria to guide development that strengthens city pattern character, document design precedents and best practices for treatments to historic resources that are consistent with the Secretary of the Interior's Standards for Rehabilitation, and programs for pedestrian wayfinding and waterfront lighting improvements, and public art installations (Policies 1e, 4f, 5e).

Financially Strong Port

This goal is new to the 2019 Plan, and describes the Port's enterprise agency and public trust responsibilities, which require the Port to generate revenues to support maintenance and waterfront capital investments, and to conduct leasing and business opportunities that generate job and economic opportunities.

The 2019 Plan includes new policies in the following areas:

1. Support investments in Port lands and facilities to advance public aspirations and trust objectives for historic rehabilitation, maritime use, public access and open space, recreation, and natural resource protection (Policy 1);
2. Grow and diversify the Port's maritime and non-maritime portfolio to support a stable source of income to the Harbor Fund through economic cycles (Policy 2);
3. Strengthen existing and develop new funding and financing resources, as identified and tracked in the Port's Capital Plan and Capital Budget, to support waterfront improvements and programs promoted in the Waterfront Plan (Policy 3); and
4. Leverage the Port's economic activity to advance equity, inclusion, and public benefit for communities in and neighboring the Port, including historically disadvantaged communities (Policy 4).

Transportation and Mobility

This goal is new to the 2019 Plan, focusing on the Port's location and relationship with the city and regional transportation network and transportation agencies, description of the land and water transportation modes and facilities supported on Port property, and support of City policies including San Francisco's Transit-First Policy.

The 2019 Plan includes new policies in the following areas:

1. Developing public transit and agency partnerships to ensure affordable, inclusive, and equitable access to all transportation modes, and improvements to Muni transit along The Embarcadero, and between Mission Bay and India Basin (Policies 1, 3);
2. Coordination with public and private water transportation providers that link Port destinations to one another and to other Bay destinations (Policies 8–10);
3. Continuing to integrate water transit into emergency response and resilience plans and strategies (Policy 11);
4. Complete the San Francisco Bay Trail, by 2030, as a continuous walking and cycling path from Aquatic Park to India Basin (Policies 12a–12e);
5. Coordinating with San Francisco Municipal Transportation Agency (SFMTA) on projects to make bicycling more attractive than driving, working to increase safety and eliminate conflicts between users of all modes (Policies 2, 13–15, 18, 19);
6. Coordinating with SFMTA and other stakeholders to implement the City's Vision Zero policy and support the Embarcadero Enhancement Project (a protected bicycle facility along The Embarcadero) (Policies 16, 17);
7. Coordinating with City agencies to enhance street connections between The Embarcadero and Blue Greenway, and between the waterfront and adjacent neighborhoods (Policies 20, 21);
8. Coordinating with SFMTA to develop and enhance sustainable and reliable goods movement and industrial transportation access within the City and to Port facilities, including designation and management of curb zones for loading and access (Policies 23–30);
9. Reducing parking demand and manage parking supply to improve use of pedestrian, bicycle, and transit modes; safety; neighborhood and business vitality; reduced vehicle miles traveled and associated air quality impacts; manage parking spaces for shared use and priority for electric vehicles (Policies 31, 39);
10. Prioritizing parking management to serve disabled accessible parking, high parking turnover and customer access, maritime operations, Port tenants, and waterfront visitors (Policies 31–33);
11. Limiting or prohibiting net new automobile parking spaces, residential parking permits, and bundling of parking in Port leases (Policies 34, 37, 38);
12. Working with SFMTA to develop transportation improvements and implementation timeframes for Port tenant operations and projects consistent with the City's Climate Action Plan to work toward a goal of achieving 80 percent of trips by non-driving modes by 2030 (Policy 44);
13. Developing and implementing Port-wide and subarea Transportation Demand Management plans (Policy 46);
14. Working with the City to design and upgrade substandard Port streets to City "Better Streets" and "Complete Streets" standards (Policy 48); and
15. Transferring street maintenance responsibility to SF Public Works, where feasible; and ensure development of new streets provide adequate long-term financing for maintenance, signal, and signage operations (Policies 49, 50).

Environmental Sustainability

This goal is new in the 2019 Plan, and describes natural and environmental resources and management responsibilities along the waterfront, including the Port's regulatory compliance and environmental sustainability stewardship initiatives. The Port's environmental sustainability efforts involve managing activities and resources to protect air quality, water quality, public health, and biodiversity; and to limit the impact of climate change, improve the Bay ecology, and create healthy waterfront neighborhoods.

The 2019 Plan includes new policies in the following areas:

1. Reducing greenhouse gas emissions and maximize carbon capture and sequestration; consider incentives for carbon emissions reduction measures and improve energy efficiency (Policies 1a–1d);
2. Improving water quality through remediation of contaminated sites; repair and construct new wastewater infrastructure; continued stormwater management and new green infrastructure to reduce sewage overflows; remove harmful bay fill; build partnerships and promote education and awareness to improve water quality (Policies 2a–2f);
3. Implementing water conservation measures, including new infrastructure (Policies 3a–3b);
4. Protecting and enhancing the biodiversity of Port natural resources, including through LEED standards, wildlife and Bay-friendly practices and native plants in new projects, and natural and multi-benefit green infrastructure (Policies 4a–4h);
5. Promoting green building in Port lease and development projects, including zero waste practices, City Better Roofs Ordinance, and promoting district-level sustainability measures (Policies 5a–5g); and
6. Reducing environmental health risks from Port operations (Policy 6).

Resilient Port

This goal is new in the 2019 Plan, and describes how the Port defines and addresses the issues that would need to be addressed in the near-, middle- and long-term to support a safe and resilient waterfront. This includes protecting and adapting assets and facilities to maintain city infrastructure systems, business, recreational, cultural, and natural resources to address numerous resilience needs and challenges, such as: earthquakes, climate change, security threats, and disaster recovery.

The 2019 Plan includes new policies in the following areas:

1. Improving emergency and disaster response planning to reduce risks, coordinated with City and regional emergency managers, transportation, and infrastructure operators (Policies 1a–1g);
2. Reducing seismic risks to life safety and emergency response capabilities through continued seismic retrofit programs, including the Embarcadero Seawall (Policies 2a–2c);
3. Partnering with City, regional, state, and federal agencies, tenants, and the public to address resilience challenges and promote education and awareness (Policies 3a–3c);
4. Developing a resilience program for Port facilities that is transparent and coordinated with San Francisco's Resilience Program (Policies 4a–4h);
5. Encouraging and designing resilience projects that achieve multiple public objectives, consistent with the Waterfront Plan goals and policies (Policies 5a–5f); and
6. Ensuring that the Port's resilience plans make equity a priority and identify ways to build community capacity, participation, and social cohesion to help communities withstand and recover from disasters (Policies 6a–6e).

Partnering for Success

This goal is new in the 2019 Plan, and describes public trust and regulatory requirements, as well as public agency partnerships and collaborations necessary to support improvement projects and programs at the Port. This also requires active engagement and partnerships with Port advisory committees, Port tenants, and regional residents and waterfront stakeholder organizations, including community stakeholders who historically have not had a voice in public discussions about opportunities and benefits that should be provided along the Port waterfront.

The 2019 Plan includes new policies in the following areas:

1. Strengthen Port advisory committee public engagement and communications, including outreach and inclusion of all voices affected by Port land use planning development, leasing, environmental, resilience, and business activities (Policies 3–4);
2. Conduct a robust community input process for competitive solicitations of specified types of Port lease and development project opportunities, including consultation with the Port Commission and public about public trust values and objectives to inform the lease/development solicitation opportunity, and developing procedures for producing developer selection recommendations to the Port Commission (Policies 5–6);
3. Review process for consideration of unsolicited (sole source) lease/development proposals (Policy 7);
4. Develop Port Commission and Port advisory committee review requirements for Port non-maritime leases that do not otherwise require approval by the San Francisco Board of Supervisors (Policy 8);
5. Develop Port Commission and Southern Waterfront Advisory Committee review requirements for intermediate and long-term lease proposals in the Piers 80–96 Maritime Eco-industrial Strategy area (Policy 9);
6. Develop use limitations and public notice and review requirements for short-term interim leases in the Southern Waterfront (Policy 10); and
7. Identify and exempt certain types of Port leases – such as short-term leases for maritime; light-industrial; and existing office, retail, and restaurant uses, and intermediate-term lease renewals of bulkhead buildings for existing public-oriented uses – from additional public review beyond that required by applicable City regulations (Policy 11).

Waterfront Subarea Objectives

The nine goals summarized above establish the policy framework that applies Port-wide, across the 7.5-mile waterfront. The 2019 Plan also identifies five waterfront subareas and describes objectives for each of these areas based on the key maritime, environmental, open space, historic preservation or other issues within that geography. The 2019 Plan includes updates to these subarea objectives, which extend from the Port-wide goals and policies. The subarea objectives provide guidance for future lease and waterfront improvement proposals and are accompanied by Acceptable Use Tables that indicate the range of maritime and non-maritime uses allowed for the Port facilities located within the given area. The 2019 Plan includes proposed changes to the Acceptable Land Use Tables in association with the updated subarea objectives and Port-wide goals and policies. The subarea objectives are noted below, and the proposed changes to the Acceptable Land Use Tables will be discussed in the IS and the EIR.

Fisherman's Wharf

1. Protect and maintain Fisherman's Wharf as a working fishing port;
2. Maintain a colorful mix of maritime and water-dependent activities at Fisherman's Wharf, in addition to fishing;
3. Enhance the public access experience and open space programming in Fisherman's Wharf;
4. Maintain the Wharf's diverse mix of public, commercial, and maritime activities, an include activities that attract local residents and dispel the Wharf's image as a tourist-only attraction;
5. Work closely with longstanding Fisherman's Wharf restaurants and businesses to coordinate investments in infrastructure improvements that maintain public safety and economic vitality and adapt to sea level rise; and
6. Manage transportation flow to and through Fisherman's Wharf to maintain viable industrial and loading access for the fishing industry and commercial businesses, reduce single-occupant vehicle use, increase public transit service levels, provide continuing enhancements of the pedestrian and bicycle experience, and support efficient parking operations for waterfront visitors to the Wharf.

Northeast Waterfront

1. Protect and enhance the historic maritime character of the Northeast Waterfront;
2. Maximize opportunities to retain and enhance maritime operations in the Northeast Waterfront;
3. Activate the Northeast Waterfront with an array of uses that establish a daytime and nighttime presence but are not primarily tourist-oriented;
4. On Northeast Waterfront seawall lots, create new developments that complement the surrounding neighborhood and highlight connections between upland neighborhoods and the waterfront;
5. Provide public access amenities that highlight newly created points of interest, more diverse recreational options and events to activate the Pier 27 Cruise Terminal Park, and wayfinding systems to enhance public enjoyment of the Northeast Waterfront open space and public access network;
6. Provide a mix of uses in the Northeast Waterfront that emphasizes the civic importance of the Ferry Building area, generates waterfront activity, and serves San Franciscans and visitors alike;
7. Maintain close working relationships with the San Francisco Municipal Transportation Agency and transportation agency partners to expand Northeast Waterfront public transit and alternative transportation services that improve the safety and comfort of travel along the Embarcadero;
8. Provide efficiently planned parking and loading facilities to serve new activities in the Northeast Waterfront; and
9. Coordinate closely with resilience proposals produced through the Embarcadero Seawall Program to build understanding and support for innovations required to adapt to the impacts of climate change while respecting the history, character, and authenticity of the Northeast Waterfront.

South Beach

1. Preserve and improve existing maritime uses and provide focal points for public enjoyment of maritime and water-dependent activities in South Beach;
2. Maintain and activate an integrated series of parks and public access improvements that extend through South Beach, and provide a unifying pedestrian connection to Mission Bay at China Basin Channel;

3. Promote activities and public access in South Beach pier projects within the Embarcadero Historic District;
4. Create opportunity for the design of new development in South Beach to create a new architectural identity while respecting the Embarcadero Historic District;
5. Take advantage of proximity to downtown San Francisco by providing attractions for the general public while respecting the living environment of the Rincon Hill and South Beach neighborhoods;
6. Maintain close working relationships with the San Francisco Municipal Transportation Agency and transportation agency partners to expand public transit and alternative transportation services that improve the safety and comfort of travel along the Embarcadero in South Beach; and
7. Coordinate closely with resilience proposals produced through the Embarcadero Seawall Program to build understanding and support for innovations required to adapt to the impacts of climate change while respecting the history, character, and authenticity of the South Beach waterfront.

Mission Bay

1. Complete the Blue Greenway public access and open space improvements through the Mission Bay waterfront;
2. Preserve berthing for maritime and deep-water vessels at piers along the Mission Bay waterfront, and give first priority to maritime needs at Pier 50;
3. Maintain and, where possible, increase services and amenities to enhance businesses, recreational boating uses, and public use, safety, and enjoyments of water recreation along the Mission Bay waterfront;
4. Preserve and restore Pier 48 to recall the Mission Bay waterfront's historic use and to accommodate new uses; and
5. Maintain close working relationships with the San Francisco Municipal Transportation Agency and transportation agency partners to support the expansion of public transit and alternative transportation services that serve new development along the Mission Bay waterfront and Central Waterfront while maintaining viable access for Port maritime and maintenance services.

Southern Waterfront

1. Continue inter-agency coordination to align maritime, industrial, and development priorities and investments in the Southern Waterfront;
2. Throughout the Southern Waterfront, improve and enhance Blue Greenway open space and public access areas that do not compromise maritime operations or sensitive environmental habitat areas, and provide education to promote public safety among maritime, small boating, and recreational water users;
3. Implement approved development plans for the Pier 70 Special Use District, Historic Core, and Crane Cove Park projects to connect and integrate all areas within Pier 70, which will give new life to the Union Iron Works Historic District and create a unique waterfront neighborhood addition in the Dogpatch area;
4. Explore new business partnerships to operate the Pier 70 ship repair and dry-dock facility, as part of a broader maritime strategy that evaluates additional maritime opportunities for the shipyard site and facilities;
5. Increase marketing efforts to support maritime business partnerships to maximize the utilization of existing cargo terminal facilities in a dynamic urban environment;

6. In the Piers 90–94 Backlands, pursue development of industrial warehouse facilities that are compatible with cargo terminal operations and provide space for maritime support uses, generate economic value and benefits to the Port and community, and productively improve land to support a stable industrial base in San Francisco;
7. Protect wildlife habitat and shoreline areas; and
8. Work with the community to assess vulnerabilities, consequences, and community priorities to build resilience, reduce risks, and advance benefits in the Southern Waterfront.

Growth Assumptions

The 2019 Plan goals and policies guide the type and mix of land uses and improvement projects that could be constructed or implemented along the 7.5-mile waterfront and adjacent properties within the Port's jurisdiction. Under the 2019 Plan, the Port may pursue leases; development agreements; and shoreline restoration and improvement projects for maritime, industrial, commercial, recreational, environmental sustainability, and other purposes. In order to analyze the environmental impacts as a result of changes that could occur, the San Francisco Planning Department will develop land use growth assumptions in coordination with the Port, based on the amended goals and policies proposed for the 2019 Plan. These growth assumptions will form the basis of the analysis of impacts on environmental resources considered in the IS and the EIR.

Required Project Approvals

State and Regional Agencies

San Francisco Bay Conservation and Development Commission

- Approval of amendments to the San Francisco Waterfront Special Area Plan

Local Agencies

San Francisco Port Commission

- Adoption of CEQA findings
- Approval of amendments to the Waterfront Plan

San Francisco Planning Commission

- Adoption of CEQA findings
- Recommendation to the Board of Supervisors to approve amendments to the general plan, planning code, and zoning map, including updates to the waterfront design review procedures

San Francisco Board of Supervisors

- Approval of amendments to the general plan, planning code, and zoning map, including updates the waterfront design review procedures

Summary of Potential Environmental Issues

The proposed project could result in potentially significant environmental impacts. The San Francisco Planning Department will prepare an IS and an EIR to evaluate the physical environmental effects of the 2019 Plan goals and policies, including the growth assumptions and conceptual subsequent development projects. The IS will assess both project-specific and cumulative impacts for all topics required under CEQA and will identify which environmental topic areas may be significantly impacted by the project. As required by CEQA, an EIR will further examine those issues identified in the IS to have potentially significant impacts, identify mitigation measures, and analyze whether the proposed mitigation measures would reduce potentially significant environmental impacts to a less-than-significant level. The IS will be published as an appendix to the Draft EIR and will be considered part of the EIR.

The EIR (including the IS) will evaluate the environmental impacts of the proposed project resulting from construction and operation activities, and will propose mitigation measures for impacts determined to be significant. The EIR will also identify potential cumulative impacts that consider impacts of the project in combination with impacts of other past, present, and reasonably foreseeable future projects. The EIR will address all environmental topics in the San Francisco Planning Department's CEQA environmental checklist, including the following environmental topics:

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

In addition, the EIR will include an analysis of the comparative environmental impacts of feasible alternatives to the proposed project that would reduce or avoid one or more of the significant impacts of the project while still meeting most of the project objectives. Alternatives to be considered include a No Project Alternative, as described in CEQA Guidelines section 15126.6, which considers reasonably foreseeable conditions at the project site if the proposed project is not implemented. Other alternatives will be evaluated as necessary, depending on the results of the impact analyses of the various environmental topics listed above. The EIR will also include a discussion of topics required by CEQA, including the project's growth-inducing impacts, significant unavoidable impacts, significant irreversible impacts, any known controversy associated with the project and its environmental effects, and issues to be resolved by decision-makers.

Finding

This project may have a significant effect on the environment and an EIR is required. This determination is based upon the criteria of the state CEQA Guidelines, sections 15064 (Determining Significant Effects) and 15065 (Mandatory Findings of Significance). The purpose of the EIR is to provide information about the potential significant physical environmental effects of the proposed project, to identify possible ways to minimize any potentially significant adverse effects, and to describe and analyze possible alternatives to the proposed project. Preparation of an NOP or EIR does not indicate a decision by the City to approve or disapprove the project. However, prior to making any such decision, the decision makers must review and consider the information contained in the EIR.

Public Scoping Process

Pursuant to California Public Resources Code section 21083.9 and CEQA Guidelines section 15206, the planning department will hold a public scoping meeting to receive oral comments concerning the scope of the EIR. You may participate in the first public process concerning the project's environmental effects by attending a video or teleconference public scoping meeting on Wednesday, September 9, 2020, at 5 p.m. The planning department will hold the meeting using an online platform. You can join the meeting via the online platform link found on the Department's webpage, sfplanning.org/sfceqadocs; or via phone, using the following phone number: 833.548.0282 (Toll Free); meeting ID 831 0306 4931. To request assistance in additional languages, please contact candace.soohoo@sfgov.org or (628) 652-7550 at least 72 hours in advance of the meeting to ensure availability. Written comments will also be accepted at this meeting and until 5 p.m. on September 25, 2020. Written comments should be sent to Sherie George, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, California 94103 (Attn: Sherie George); or emailed to sherie.george@sfgov.org. If you have questions or comments concerning this notice, contact Sherie George at CPC.WaterfrontEIR@sfgov.org or 628.652.7558 by September 25, 2020.

If you work for an agency that is a Responsible or a Trustee Agency, we need to know the views of your agency as to the scope and content of the environmental information that is relevant to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. We will also need the name of the contact person for your agency. If you have questions concerning environmental review of the proposed project, contact Sherie George at 628.652.7558.

Members of the public are not required to provide personal identifying information when they communicate with the planning commission or the planning department. All written or oral communications, including submitted personal contact information, may be made available to the public for inspection and copying upon request and may appear on the department's website or in other public documents.

Anyone receiving this notice is encouraged to pass on this information to others who may have an interest in the project.

August 26, 2020
Date

Lisa Gibson
Environmental Review Officer

APPENDIX B

Initial Study

INITIAL STUDY
WATERFRONT PLAN PROJECT
PLANNING DEPARTMENT CASE NO. 2019-023037ENV

Contents

Figures

Tables

Acronyms and Abbreviations

Acronym/Abbreviation	Definition
ABAG	Association of Bay Area Governments
air board	California Air Resources Board
air district	Bay Area Air Quality Management District
AB	Assembly Bill
BCDC	San Francisco Bay Conservation Development Commission
building department	San Francisco Department of Building Inspection
C-2	Community Business zoning district
California Register	California Register of Historical Resources
Cal/OSHA	California Division of Occupational Safety and Health
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CH_4	methane
CO_2	carbon dioxide
CWA	federal Clean Water Act
DEHP	bis(2-ethylhexyl) phthalate, or diethylhexyl phthalate
EIR	environmental impact report
DTSC	California Department of Toxic Substances Control
fire department	San Francisco Fire Department
g	acceleration of gravity
GHG	greenhouse gas
health department	San Francisco Department of Public Health
LEED®	Leadership in Energy and Environmental Design
M-1	Light Industry zoning district
M-2	Heavy Industry zoning district
MR-MU	Mission Rock Mixed-Use zoning district
MB-RA	Mission Bay Redevelopment zoning district
mgd	million gallons per day
MMDP	materials management disposal plan
mph	miles per hour
MR-MU	Mission Rock Mixed-Use District zoning district

Acronym/Abbreviation	Definition
MTC	Metropolitan Transportation Commission
$MTCO_2e$	metric tons of carbon dioxide equivalents
N_2O	nitrous oxide
NAVD88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NPF	North Point Wet-Weather Facility
P	Public zoning district
parks department	San Francisco Recreation & Parks Department
PCB	polychlorinated biphenyl
POPOS	privately owned public open space
RHNA	Regional Housing Needs Allocation
ROSE	Recreation and Open Space Element
SAP	Special Area Plan
SB	Senate Bill
SEP	Southeast Treatment Plant
SFMTA	San Francisco Municipal Transportation Agency
SFPUC	San Francisco Public Utilities Commission
SMR	San Francisco Stormwater Management Requirements and Design Guidelines
SPCC	Spill prevention control and countermeasure
state board	State Water Resources Control Board
SUD	Special Use District
SWPPP	stormwater pollution prevention plan
TMDL	total maximum daily load
USEPA	United States Environmental Protection Agency
UST	underground storage tank
WDR	waste discharge requirement
WSIP	Water System Improvement Program

A. Project Description

The project description for the Waterfront Plan (proposed project) is included as Chapter 2, Project Description, in the draft environmental impact report (Draft EIR) to which this initial study is appended.

B. Project Setting

The project setting for the proposed project is included in Draft EIR Chapter 2, Project Description, to which this initial study is appended.

C. Compatibility with Existing Zoning and Plans

	Applicable	Not Applicable
Discuss any variances, special authorizations, or changes proposed to the planning code or zoning map, if applicable.	☒	☐
Discuss any conflicts with any adopted plans and goals of the City or region, if applicable.	☒	☐
Discuss any approvals and/or permits from city departments other than the planning department or the Department of Building Inspection, or from regional, state, or federal agencies.	☒	☐

See Draft EIR Chapter 3, Plans and Policies, for a detailed discussion of land use plans applicable to the Waterfront Plan and identification of the Plan's potential to be inconsistent with any of those plans or policies.

D. Summary of Environmental Effects

The Waterfront Plan could potentially result in adverse physical effects on the environmental resources checked below, and where those impacts are significant or potentially significant, the California Environmental Quality Act (CEQA) requires identification of mitigation measures to reduce the severity of the impacts to less than significant to the extent feasible. The initial study and the Draft EIR present a more-detailed checklist and discussion of each environmental resource.

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

This initial study evaluates the potential for the Waterfront Plan to result in significant environmental impacts and identifies which environmental resource topics are appropriately analyzed in the initial study and those that warrant more-detailed analysis in the Draft EIR.

1. Effects Found to Be Potentially Significant

This initial study, the resource topics for which there is a potential for impacts to be significant or for which the analysis requires additional detail are analyzed in the Draft EIR and are as follows:

- Aesthetics (all topics)
- Cultural Resources (historic resources)
- Transportation and Circulation (all topics)
- Noise (all topics)
- Air Quality (all topics)
- Biological Resources (all topics)

2. Effects Found Not to Be Significant

This initial study determined that the potential individual and cumulative environmental effects on the following resource topics are either less than significant or would be reduced to a less-than-significant level with the mitigation measures identified in this initial study:

- Land Use and Planning (all topics)
- Population and Housing (all topics)
- Cultural Resources (archeological resources)
- Tribal Cultural Resources (all topics)
- Greenhouse Gas Emissions (all topics)
- Wind (all topics)
- Shadow (all topics)
- Recreation (all topics)
- Utilities and Service Systems (all topics)
- Public Services (all topics)
- Geology and Soils (all topics)
- Mineral Resources (all topics)
- Energy Resources (all topics)
- Agricultural and Forest Resources (all topics)
- Wildfire (all topics)

Impacts associated with these topics are discussed with mitigation measures, where appropriate, in Section E, Evaluation of Environmental Effects, of this initial study, and require no further environmental analysis in the Draft EIR. All mitigation measures identified in this initial study are listed in Section F, Mitigation Measures, and have been agreed to be implemented by the Port as part of implementation of the Waterfront Plan, if approved. For each checklist item, the evaluation considers both Waterfront Plan-specific and cumulative impacts.

3. Approach to Cumulative Impact Analysis

The cumulative impact analyses for topics addressed in Section E, Evaluation of Environmental Effects, uses a combination of the list-based and citywide projections-based approach.[1] Reasonably foreseeable development and infrastructure projects that could potentially contribute to cumulative impacts on various resource topics are listed on p. 4-8 of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures Cumulative Impacts, of this Draft EIR.

E. Evaluation of Environmental Effects

1. Land Use and Planning

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
1. LAND USE AND PLANNING. Would the project:					
a) Physically divide an established community?	☐	☐	☒	☐	☐
b) Cause a significant physical 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?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

EXISTING LAND USES WITHIN THE PLAN AREA

The Waterfront Plan area encompasses 7.5 miles of developed, urbanized waterfront that extends from the curved, northeast shore adjacent to Aquatic Park in Fisherman's Wharf to Heron's Head Park near India Basin in the southeast. Land uses within the Waterfront Plan area include commercial, residential, recreational, park, industrial, maritime, and public uses. The Waterfront Plan area is divided into the Northern Waterfront and Southern Waterfront with five subareas. See Draft EIR Chapter 2, Project Description, for a more-detailed description of the subareas and land uses contained within each subarea.

[1] See Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, in the "Approach to Cumulative Impact Analysis" section, for a discussion of the list-based and projections-based approach to the cumulative analysis.

EXISTING PLANNING CODE ZONING DISTRICTS

The Waterfront Plan area contains the following zoning districts: Community Business (C-2), Light Industry (M-1), Heavy Industry (M-2), Public (P), Mission Rock Mixed-Use District (MR-MU), Mission Bay Redevelopment (MB-RA),[2] and Mission Rock Mixed-Use (MR-MU) (see Figure 2-4, p. 2-9; Figure 2-7, p. 2-13; Figure 2-10, p. 2-17; Figure 2-13, p. 2-21; and Figure 2-16, p. 2-25, in Draft EIR Chapter 2, Project Description).

COMMUNITY BUSINESS (C-2)

Uses permitted in the C-2 district include commercial, residential, entertainment, recreational, industrial, institutional, automotive, and utility. C-2 districts provide convenience goods and services to residential areas of the city, both in outlying sections and in closer-in, more densely built communities. The extent of these districts varies from smaller clusters of stores to larger concentrated areas, including both shopping centers and strip developments along major thoroughfares, and in each case the character and intensity of commercial development are intended to be consistent with the character of other uses in the adjacent areas. The emphasis in C-2 districts is on compatible retail uses, but the district also allows a wider variety of goods and services to suit the longer-term needs of customers and a greater latitude is given for the provision of automobile-oriented uses.

LIGHT INDUSTRY (M-1)

The M-1 district is suitable for smaller industries dependent upon truck transportation, while the M-2 District is more suitable for larger industries served by rail and water transportation and by large utility lines. In the M-1 District, most industries are permitted, but some with particularly noxious characteristics are excluded. The permitted industries have certain requirements as to enclosure, screening, and minimum distance from residential districts.

HEAVY INDUSTRY (M-2)

The M-2 district is the least restrictive as to permitted uses and is located at the eastern edge of the city, separated from residential and commercial areas. M-2 districts permit maritime uses, shipyards, manufacturing of most types, and agriculture, along with office, retail, and entertainment uses. Student housing and single-room occupancy residential units are permitted, but other residential uses, along with hotels, are permitted only with a conditional use authorization. Certain land uses are expressly prohibited in M-2 districts, including child care, hospitals, and schools. Heavier industries are permitted, with fewer requirements as to screening and enclosure than in the M-1 District, but many of these uses are permitted only as conditional uses or at a considerable distance from residential districts. Most of the land zoned M-2 is controlled by the Port.

PUBLIC (P)

The P District applies to land that is owned by a governmental agency and in some form of public use, including open space.

[2] The land use zoning for Mission Bay is administered through the Mission Bay South Redevelopment Plan.

MISSION ROCK MIXED-USE DISTRICT (MR-MU)

MR-MU is the zoning designation for the Mission Rock site and is co-terminus with the boundaries of the Mission Rock Special Use District (SUD) described below.

MISSION BAY (MB)

MB-RA is the zoning designation on the SF Planning Code's Map ZN-08 that is co-terminus with the boundaries of the Mission Bay Redevelopment Plans [Mission Bay North and Mission Bay South]. Article 9 of the planning code provides a comprehensive zoning system for Mission Bay Use Districts that are consistent with the objectives and policies set forth in the Mission Bay Plan, a part of the San Francisco Master Plan.

SPECIAL USE DISTRICTS AND BULK AND HEIGHT DISTRICTS

In addition to the above noted zoning districts, the Waterfront Plan area also includes a number of special use districts (SUD) overlays and bulk and height districts (see Figure 2-5, p. 2-10; Figure 2-8, p. 2-14; Figure 2-11, p. 2-18; Figure 2-14, p. 2-22; Figure 2-17, p. 2-26; Figure 2-18, p. 2-39; and Figure 2-19, p. 2-40, in Draft EIR Chapter 2, Project Description).

WATERFRONT SUDS

The Waterfront SUDs set forth in the planning code establish design review procedures with respect to major new non-maritime development on certain land under the Port Commission's jurisdiction within the Waterfront SUDs, consistent with the provisions of the Port's 1997 Waterfront Land Use Plan and its Waterfront Design and Access goals, objectives, and criteria, as described in section 240 of the planning code. Waterfront SUD 1 (piers) and Waterfront SUD 3 (landside) districts apply to Port piers and seawall lots north of the China Basin Channel.

MISSION ROCK SUD

The Mission Rock SUD (see Figure 2-18, p. 2-39, in Draft EIR Chapter 2, Project Description) was established to facilitate the City's long-term goal of development of the Mission Rock neighborhood. The purpose of this SUD, along with other implementing documents such as the Mission Rock Design Controls, is to implement the Mission Rock Affordable Housing, Parks, Jobs, and Historic Preservation Initiative approved by city voters on November 3, 2015 (Proposition D), which seeks the development of a mixed-use, transit-oriented community on the waterfront near public transit, major new housing, including a significant amount of affordable housing, increased public access and open spaces, extensive infrastructure improvements, shops, restaurants, cafes, neighborhood-serving retail, community spaces, commercial/office and light industrial/production space, preservation and renovation of historic Pier 48, job creation, responsiveness to climate change and resulting sea-level rise, and the generation of revenue to fund public improvements.

PIER 70 SUD

Most of the Pier 70 SUD is located within the Waterfront Plan area. The Pier 70 SUD (see Figure 2-19, p. 2-40, in Draft EIR Chapter 2, Project Description) includes a multi-phase, mixed-use development approved by the City that was analyzed in the Pier 70 Mixed-Use District Project FEIR, certified on August 24, 2017. The Pier 70 SUD was adopted in 2017 in connection with approval of that project. The Pier 70 SUD permits various land uses, including residential, institutional (except hospital), retail, office, entertainment/arts/recreation, certain industrial, and production, distribution, and repair uses and parking, subject to state laws governing the Port. The SUD also sets forth design standards and guidelines with respect to land use; open space; streets and

streetscapes; parking and loading; building massing, design, and compatibility with historic resources; and lighting, signage, and public art.

POTRERO POWER STATION SUD

A small portion of the Potrero Power Station SUD is located within the Waterfront Plan area (see Figure 2-19, p. 2-40, in Draft EIR Chapter 2, Project Description). The Potrero Power Station SUD includes a multi-phase, mixed-use development approved by the City that was analyzed in the Potrero Power Station Mixed-Use Development Project FEIR, certified on January 30, 2020. The Potrero Power Station SUD was adopted in 2020 in connection with approval of that project. This SUD area is generally bounded by 22nd Street to the north, the San Francisco Bay to the east, 23rd Street to the south, and Illinois Street to the west. This SUD establishes land use controls and incorporates design standards and guidelines for the Potrero Power Station project.

The Waterfront Plan proposes no changes to the existing Mission Rock, Pier 70, or Potrero Power Station SUDs.

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. As described in Draft EIR Chapter 2, Project Description, the Waterfront Plan retains the following 1997 Plan goals and updates the associated policies: maritime, diversity of activities and people, public access and open space, and urban design and historic preservation. The Waterfront Plan includes five new goals and policy sections to address transportation access, financial and public trust requirements, environmental sustainability, resilience and public engagement, and reviews of proposed lease and development projects. Port projects are subject to review by various planning agencies and regulatory authorities including the San Francisco Planning Department, San Francisco Bay Conservation Development Commission (BCDC), and the California State Lands Commission. The Port works to align and coordinate planning policies and principles among these agencies to support implementation of waterfront improvements. As such, the proposed amendments to the Waterfront Plan would trigger a need for conforming amendments to the planning code, zoning map, and general plan to align planning policies and procedures.

The Waterfront Plan amendments would not require any changes to the height and bulk district for Port property. However, the proposed project would amend the planning code by adding section 240.4 to create Waterfront SUD 4. The SUD would apply to Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs. The planning code amendment would require waterfront design review process and procedures for future non-maritime development on Port-owned properties in the Mission Bay and Southern Waterfront subareas. The Waterfront Plan also would amend the San Francisco Planning Code Sectional Map SU08 of the City and County's Zoning Map to reflect the creation of Waterfront SUD 4. The Waterfront Plan would allow for faster approval of qualified projects.

The land use and planning analysis evaluates the impacts of the subsequent lease, development, and improvement projects (subsequent projects) anticipated to occur under the Waterfront Plan with respect to existing conditions. To the extent that development under the Waterfront Plan would result in physical environmental impacts that would indicate a potential policy inconsistency, those impacts are analyzed in the applicable topic section of this initial study or in the Draft EIR. A proposed project's inconsistency with a plan that is applicable to the project does not, in itself, result in an adverse physical impact on the environment. However, such an inconsistency may, at least in some cases, be indicative of an adverse physical impact. The

determination of a significant impact, which, by definition, must involve a physical change in the environment, is separate from the legal determination of plan consistency.

IMPACTS AND MITIGATION MEASURES

Impact LU-1: The Waterfront Plan would not physically divide an established community. ***(Less than Significant)***

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. The Plan also would amend the planning code to create the Waterfront SUD 4, which would require waterfront design review process and procedures for future development on Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs.

The Waterfront Plan retains policies from the 1997 Plan that encourage high-quality design and integration with adjacent areas, including maintaining a continuous waterfront walkway that connects parks, public access, and activity areas from Fisherman's Wharf to India Basin, and provide improvements to the San Francisco Bay Trail (Policy 7); and improving open spaces to enhance connections between the city, waterfront, and the bay through design, wayfinding, and interpretive exhibits (Policy 11). The Waterfront Plan also includes updated or new policies that further strengthen this goal, including promoting ways to create and improve the public realm and connections between the city, waterfront, and the bay (Policies 2, 3, and 11).

The Waterfront Plan's proposed amendments to the planning code, zoning map, and general plan for the creation of Waterfront SUD 4 would establish design review procedures to review the urban design of new development on Port-owned land in the Mission Bay and Southern Waterfront subareas, consistent with the provisions of the Port's Waterfront Plan, as described in planning code section 240. These changes would not alter the physical layout of the Plan area such that movement within or across the Plan area would be obstructed.

Subsequent projects that could occur under the Waterfront Plan would not divide an established community. The Waterfront Plan also does not propose any roadways, such as freeways, that would divide the Waterfront Plan area or isolate individual neighborhoods within it. As such, the Waterfront Plan would have a ***less-than-significant*** impact related to the division of an established community.

Mitigation: None required.

Impact LU-2: The Waterfront Plan would not cause a significant physical environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. ***(Less than Significant)***

See Chapter 3, Plans and Policies, for a detailed discussion of potential conflicts with land use plans and policies that are applicable to the Waterfront Plan. The discussion that follows summarizes the key findings of the analysis.

The Waterfront Plan amendments would not require any changes to the zoning or height and bulk districts for Port property. However, the proposed project would amend the planning code and zoning map by adding

section 240.4 to create Waterfront SUD 4. The SUD would apply to Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs. The planning code amendment would require waterfront design review process and procedures for future development on Port-owned properties in the Mission Bay and Southern Waterfront subareas. The Waterfront Plan also would amend the San Francisco Planning Code Sectional Map SU08 of the City and County's Zoning Map to reflect the creation of Waterfront SUD 4.

As part of the proposed project, and as described in Draft EIR Chapter 2, Project Description, and Draft EIR Chapter 3, Plans and Policies, the Port has filed a BCDC application to amend the San Francisco Waterfront Special Area Plan (SAP), which specifically addresses the San Francisco waterfront, including all Port properties over or within 100 feet of the shoreline of the San Francisco Bay. Key SAP amendments, which are intended to align Port and BCDC policies, would include the following:

- Create a comprehensive approach to support planned network of shoreline parks and public access along the Port's 7½-mile waterfront, park activation, and programs to increase recreational use and benefits to a broader range of populations, including historically disadvantaged communities;
- Replace the BCDC "50% Rule"[3] governing bay fill, pier repair, and use rules on Fisherman's Wharf and Southern Waterfront properties with a policy that recognizes and permits uses consistent with the public trust doctrine and Burton Act, and include public access and other public benefits for both waterfront areas;
- Update information and policies to recognize maritime industries and berthing requirements, and criteria for determining conditions when public access and maritime uses can share space on piers, and when public access is not compatible with maritime operations;
- Recognition of the Embarcadero Historic District and policies to support historic pier rehabilitation projects;
- Replace an existing SAP public benefit obligation to create an Open Water Basin by removing eastern end of Pier 23 with the creation of a new public plaza and Open Water Basin on the bay side of the Ferry Building;
- Policies to support public realm improvements that improve public access, safety, and mobility along and between the city and the waterfront; and
- Policies to recognize and support resilience and adaptation of piers, wharves, and shoreline properties in coordination with BCDC's Bay Plan and Bay Adapt planning process, and the Port's Waterfront Resilience Program.

Physical effects that could result from subsequent projects pursuant to the Waterfront Plan and the aforementioned planning code amendments are analyzed as secondary effects in this initial study and Draft EIR. With regard to subsequent projects under BCDC's jurisdiction, BCDC would need to find them to be consistent with the McAteer-Petris Act and the policies and findings of the Bay Plan and SAP, as amended, prior to approving BCDC permits to allow the implementation of subsequent projects. Additionally, subsequent projects that could occur under the Waterfront Plan would adhere to applicable environmental regulations,

[3] The *Replacement Fill Policy (50% Rule)* provides, in part, that BCDC can permit fill on publicly owned land for bay-oriented commercial recreation and bay-oriented public assembly, provided that the fill is a replacement pier that covers less of the bay than was being uncovered, and the amount of bay-oriented commercial recreation or bay-oriented public assembly uses cover nor more than 50 percent of the area of the bay uncovered and the remainder (50 percent) of the replaced pier must be used either for public recreation, public access, or open space, including open water.

specifically those of the general plan and planning code, as amended, and would not conflict with policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect such that a substantial adverse physical change in the environment would result. As such, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-LU-1: The Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact related to land use and planning. ***(Less than Significant)***

The cumulative projects in the Waterfront Plan area and vicinity are identified under, Cumulative Impacts, p. 4-8, in Chapter 4 of the Draft EIR. These projects would be located on infill sites, replacing existing uses with new residential, commercial, parking, hotel, maritime, open space, and related uses. The subsequent projects that could occur with implementation of the Waterfront Plan would be located primarily on undeveloped seawall lots or piers.

The cumulative projects, individually or in combination with the Waterfront Plan, would not divide an established community. The cumulative projects, as with the subsequent projects that could occur pursuant to the Waterfront Plan, would aim to enhance neighborhood connectivity, improve public spaces, and increase the safety of streets and intersections for all users, consistent with San Francisco planning policies. In addition, as noted above, conflicts with existing land use plans and policies do not, in and of themselves, give rise to a significant physical impact related to land use and planning under CEQA. For these reasons, conflicts with plans and policies, considered with cumulative projects, could not combine to result in a significant cumulative impact related to land use. As such, the Waterfront Plan would not combine with cumulative projects within or in the vicinity of the Plan area to result in a significant cumulative land use and planning impact. For these reasons, the Waterfront Plan, in combination with cumulative projects, would result in a ***less-than-significant*** cumulative impact related to land use and planning.

Mitigation: None required.

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2. Aesthetics

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
2. AESTHETICS. Except as provided in Public Resources Code section 21099, would the project:					
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☒	☐	☐	☐	☐
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) 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 daytime or nighttime views in the area?	☒	☐	☐	☐	☐

Implementation of the Waterfront Plan could have the potential to result in significant impacts related to Aesthetics; therefore, this topic is further analyzed in Draft EIR Section 4.A, Aesthetics.

3. Population and Housing

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
3. POPULATION AND HOUSING. Would the project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	☐
b) Displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The San Francisco Housing Inventory, April 2021, reports that there are approximately 403,357 housing units in the city.[4] According to the U.S. Census Bureau's most recent American Community Survey, the City and County of San Francisco had an estimated population of about 881,549 residents in 2019.[5] By 2040, the population of San Francisco is projected to increase by approximately 280,490, for a total population of 1,085,730.[6]

Citywide growth forecasts are prepared by the planning department. The department regularly updates citywide growth forecasts that are based on Association of Bay Area Governments' (ABAG) regional projections of housing and employment growth.[7] To establish baseline numbers for the Waterfront Plan, the planning department relied on a Port of San Francisco lease roll data for gross square footage and land use. According to this data, the 2020 existing conditions for the Waterfront Plan area includes approximately 410 housing units, 850 residents, and 12,910 jobs.

GROWTH ANTICIPATED IN REGIONAL AND LOCAL PLANS

San Francisco's central location, historic function as a job nucleus and employment hub for the region, and access to jobs and transit are some reasons why the city's share of regional population is expected to increase.

PROJECTED GROWTH – PLAN BAY AREA

Senate Bill (SB) 375, adopted in 2008, requires preparation of a Sustainable Communities Strategy as part of the Regional Transportation Plan for the bay area. Plan Bay Area 2050 is the Sustainable Communities Strategy for the region and was jointly adopted by ABAG and the Metropolitan Transportation Commission (MTC) in October 2021.[8] Plan Bay Area provides a transportation and land use/housing strategy for the bay area to address its transportation, mobility, and accessibility needs; land development concerns; and greenhouse gas (GHG) emission reduction requirements through 2050. The Waterfront Plan area is located within the Downtown/Van Ness/Northeast Neighborhoods, the Transbay/Rincon Hill, the Eastern Neighborhoods, and the Mission Bay Priority Development Areas, four of 12 Priority Development Areas in the city.[9] Priority Development Areas are areas where new compact development is promoted, particularly near existing and future transit connections, to support the needs of residents and employees.

Plan Bay Area 2050 estimates the region will add 1.4 million new jobs, for a total of 5.4 million bay area workers. Household growth is anticipated to follow pace, adding slightly fewer than 1.4 million new households for a total of 4 million households by 2050. This growth would bring the bay area's population to an estimated 10.3

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[4] San Francisco Planning Department, *2020 San Francisco Housing Inventory*, April 2021, https://sfplanning.org/sites/default/files/documents/reports/2020_Housing_Inventory.pdf, accessed December 7, 2021.
[5] U.S. Census Bureau, *San Francisco County, California*, 2019, https://www.census.gov/quickfacts/sanfranciscocountycalifornia, accessed January 15, 2021.
[6] Association of Bay Area Governments, Plan Bay Area, p. 40, http://files.mtc.ca.gov/library/pub/28536.pdfhttp://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf, accessed November 9, 2021.
[7] The department allocates the regional growth forecasts to 981 Traffic Analysis Zones, which are the smallest geographic units of measurement associated with existing job and household counts, in San Francisco by first accounting for in-city growth that is already anticipated (both individual projects and planning efforts) in the development pipeline, subtracting pipeline growth from the City's share of the regionally forecast growth, and allocating the residual amount of ABAG-forecast growth on the basis of weighting factors developed from analysis of both development capacity and existing development.
[8] MTC is the government agency responsible for regional transportation planning, financing, and coordinating in the nine-county San Francisco Bay Area.
[9] Association of Bay Area Governments and Metropolitan Transportation Commission, Priority Development Areas (current), https://mtc.ca.gov/planning/land-use/priority-development-areas-pdas, November 10, 2021.

million residents by 2050, up from around 7.8 million in 2021. Plan Bay Area 2050 estimates the region would need to build another 1.4 million new homes by 2050 to meet forecasted future demand.[10]

In the bay area, the Sustainable Communities Strategy and the Regional Housing Needs Allocation (RHNA) are mutually reinforcing. They were developed together to meet the overlapping objectives of SB 375 and housing element law. The objectives include increasing the supply, diversity, and affordability of housing; promoting infill development and a more efficient land use pattern; promoting an improved intraregional relationship between jobs and housing; protecting environmental resources; and promoting socioeconomic equity. SB 375, which requires the RHNA to be consistent with the Sustainable Communities Strategy, establishes an 8-year cycle for the RHNA.

PROJECTED GROWTH – SAN FRANCISCO HOUSING ELEMENT

The 2014 housing element (adopted April 2015) of the San Francisco General Plan requires zoning and development standards that encourage and promote below-market-rate housing as well as a diverse range of housing opportunities. In addition, it describes housing needs in the city and identifies development capacity for new housing, based on land supply. The element focuses on the city's critical need for below-market-rate housing. The housing element establishes goals for housing production as well as policies related to reducing the impacts of growth on the housing market.[11]

According to the planning department and ABAG, San Francisco is expected to gain approximately 101,000 households and 280,000 residents between 2010 and 2040 and have a population of more than 1 million, a 35 percent increase in residential population. Employment is forecast to increase by 34 percent (191,000 jobs) during this period to a total of approximately 760,000.[12]

ABAG, in coordination with the California State Department of Housing and Community Development, determines the bay area's regional housing need, which is based on regional trends, projected job growth and existing needs. San Francisco's fair share of the regional housing need for January 2015 through June 2022 was calculated to be 28,870 units, or about 3,850 units per year.[13] The goal is to alleviate the tight housing market stemming from forecast household and employment growth as well as allocate regional household and employment growth to jurisdictions with established or planned transit infrastructure. More important, the RHNA determination includes production targets that address the housing needs of a range of household income categories. A total of about 16,333 units, or 57 percent of the RHNA target, must be below-market-rate to households making 120 percent of the area median income or less. With respect to income category, ABAG determined that, between January 2015 and June 2022, the City would need to provide approximately 6,234 housing units to those with very low incomes, 4,639 housing units to those with low incomes, and 5,460 housing units to those with moderate incomes to meet its RHNA obligations.[14]

As discussed in the 2014 housing element, between 2007 and the first quarter of 2014, the City made progress toward meeting targets for market-rate housing under the 2007–2014 RHNA. The City met 41 percent of its production goal for low-income housing (i.e., less than 80 percent of area median income) and 16 percent of

[10] Association of Bay Area Governments and Metropolitan Transportation Commission, 2021, Plan Bay Area 2050, A Vision for the Future, Final, Released October 1, 2021, https://www.planbayarea.org/finalplan2050, accessed November 11, 2021.
[11] City and County of San Francisco, *2014 General Plan Housing Element*, Adopted April 27, 2015, Updated August 2020, https://default.sfplanning.org/plans-and-programs/planning-for-the-city/housing-element/2014HousingElement-AllParts_ADOPTED_web.pdf, accessed November 10, 2021.
[12] Association of Bay Area Governments and Metropolitan Transportation Commission, *Jobs-Housing Connection Strategy*, May 16, 2012, https://www.planbayarea.org/sites/default/files/pdf/JHCS/May_2012_Jobs_Housing_Connection_Strategy_Main_Report.pdf, accessed January 15, 2021.
[13] Ibid.
[14] Ibid.

its production goal for moderate-income housing (i.e., 80 to 120 percent of area median income). When the 2014 housing element was prepared, the 2015–2022 planning period had not begun; therefore, the "housing pipeline" was used to provide an estimate of the future quantity of housing and determine how it compared to the RHNA targets. The department defines the pipeline as those projects with a land use or building permit application. Housing production in the city is estimated in the 2014 housing element to total approximately 20,170 units, including units in the pipeline, units to be rehabilitated (non-public housing), and units for conservation/preservation (public housing).[15] Compared to the RHNA targets for 2014–2022, this would result in an estimated shortfall in the city of approximately 8,699 units.[16] San Francisco's share of the RHNA is incorporated into the City's 2014 housing element (originally adopted in March 2011 and most recently re-adopted with amendments on April 27, 2015). As required by state law, the housing element of the general plan discusses the City's fair-share allocation of regional housing needs by income, as projected by ABAG.

As discussed in the 2014 housing element, the Better Neighborhoods Program was initiated by the planning department to address the City's related housing and transportation challenges. It seeks to do so by strengthening the linkages between land use and transportation planning, so that each one effectively supports the other. The Central Waterfront (along with Market and Octavia and Balboa Park) was among three neighborhoods selected to serve as a model for other areas in the city. These neighborhoods' proximity to transit and essential services are ideal for additional housing, including units in upper stories above commercial uses. As discussed in the housing element, the Central Waterfront Area Plan,[17] which is located in the Southern Waterfront subarea of the Waterfront Plan, allows for the potential development of about 1,100 to 1,500 new units.[18]

ACCOMMODATING JOBS AND HOUSING GROWTH

As discussed above, San Francisco's official quantified targets for addressing housing needs are provided by ABAG, in coordination with the California Department of Housing and Community Development, as part of the RHNA. The RHNA is required by state law to promote the state's interest in increasing housing supply, increasing the mix of housing types and affordability in all jurisdictions, facilitating infill development and efficient development patterns, protecting environmental resources, and reducing inter-regional commuting. The needs are defined in terms of housing market factors, such as accommodating projected demand due to household growth, employment growth, and the need to transition commuters into residents; increasing the vacancy rate to provide more choice and less upward pressure on prices and rents; and increasing the supply of below-market-rate housing options. ABAG allocates regional housing needs among jurisdictions, based on factors that consider existing employment, employment growth, household growth, and the availability of transit. Region-wide income distributions complete the allocation by household income category.

The adoption of SB 375, which required California regions as a whole to reduce GHG emissions by linking growth to transit, resulted in increased pressure on San Francisco (and other major cities, such as San José and Oakland) to accommodate a major portion of the region's growth. The City has undertaken substantial planning efforts to direct housing toward transit-supported areas.

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[15] City and County of San Francisco, *2014 General Plan Housing Element*, Adopted April 27, 2015, Updated August 2020, https://default.sfplanning.org/plans-and-programs/planning-for-the-city/housing-element/2014HousingElement-AllParts_ADOPTED_web.pdf, accessed November 10, 2021.
[16] Ibid.
[17] The geographic area covered in the Central Waterfront Area Plan is bounded by Mariposa Street on the north, San Francisco Bay on the east, Islais Creek on the south, and I-280 on the west.
[18] City and County of San Francisco, *2014 General Plan Housing Element*, Adopted April 27, 2015, Updated August 2020, https://default.sfplanning.org/plans-and-programs/planning-for-the-city/housing-element/2014HousingElement-AllParts_ADOPTED_web.pdf, accessed November 10, 2021.

Many local and regional public transit agencies have terminals and facilities on or near Port property to provide a full range of transportation services for residents, workers, and visitors. The Waterfront Plan area is in the vicinity of numerous public transit routes and facilities, including San Francisco Municipal Railway light-rail lines, regional transit routes provided by Bay Area Rapid Transit Golden Gate Transit, the San Francisco Bay and Golden Gate water ferries, and the Water Emergency Transportation Authority.

Walking and bicycling to, though, and along the waterfront, including along The Embarcadero Promenade, are sustainable transportation choices that reduce traffic congestion and GHG emissions.

Planning for new development in the Plan area to accommodate increased population growth than would otherwise be the case is one of the means by which San Francisco and the region as a whole can meet state mandates under SB 375 for a Sustainable Communities Strategy to reduce per-capita GHG emissions. The long-term projections for city and regional population and employment growth are the basis for the housing, transportation, other infrastructure, and public services and utilities planning conducted at a city and regional level. They are also the basis for efforts to secure the funding and financial support essential to realizing this level of infill development.

APPROACH TO ANALYSIS

Population growth is considered in the context of local and regional plans as well as population, housing, and employment projections. Generally, a project that induces population growth is not viewed as having a significant impact on the environment unless the physical changes that would be needed to accommodate project-related population growth would have adverse impacts on the environment. CEQA Guidelines section 15064(e) states that an economic or social change by itself would not be considered a significant effect on the environment. Employment and residential growth that could occur with implementation of the Waterfront Plan would result primarily in direct physical changes related to aesthetics, cultural resources, transportation, noise, air quality, biological resources, GHG emissions, and demand for public services and utility capacity. These physical impacts are analyzed under the other environmental topics in this document, such as Section 4.A, Aesthetics; Section 4.B, Cultural Resources; Section 4.C, Transportation and Circulation; Section 4.D, Noise; Section 4.E, Air Quality; Section 4.F, Biological Resources; and Section E.9, Greenhouse Gas Emissions.

An indirect environmental impact is a change to the physical environment that is not immediately related to the proposed project (CEQA Guidelines section 15064(d)(2)). Specifically, project-related growth-inducing effects include ways in which a project could foster economic or population growth or the construction of additional housing, either directly or indirectly. Projects that would remove obstacles to population growth (e.g., a major expansion of a wastewater treatment plant) might, for example, allow for development to occur in an area that was not previously considered feasible for development because of *infrastructure* limitations (CEQA Guidelines section 15126.2(d)). As such, indirect population growth is a secondary impact, which is considered below under Impact PH-1.

As previously discussed, the Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Plan to reflect revised or new goals, policies, and procedures and would amend the planning code to create Waterfront SUD 4. Effects on population and housing could result as subsequent projects that could occur pursuant to the Waterfront Plan could add new residential and commercial, maritime, or mixed-use projects on undeveloped seawall lots and piers. The analysis considers whether population and household growth that would occur with implementation of the

Waterfront Plan would be considered substantial relative to remaining planned growth potential in the city. ABAG projections were used to analyze whether the growth caused by the Waterfront Plan would be within planned growth projections. Specifically, ABAG projections for 2020 are used to represent existing (baseline) conditions, and projections for 2050 are used to represent future (build-out) conditions.

IMPACTS AND MITIGATION MEASURES

Impact PH-1: The Waterfront Plan would not induce substantial unplanned population growth beyond that projected by regional forecasts, either directly or indirectly. ***(Less than Significant)***

CONSTRUCTION

It is anticipated that construction employees associated with subsequent projects that could occur with implementation of the Waterfront Plan who are not already living in the city would commute from their residences elsewhere in the bay area rather than permanently relocate to San Francisco from more distant locations; this is typical for employees in the various construction trades. Once the construction projects are complete, construction workers typically seek employment at other job sites in the region that require their particular skills. Thus, construction of subsequent projects that could occur pursuant to the Waterfront Plan would not generate a substantial unplanned population increase in the city or region. Temporary impacts associated with an unplanned increase in population during the construction periods for subsequent projects that could occur pursuant to the Waterfront Plan would be ***less than significant***.

OPERATION

Subsequent development projects that could occur pursuant to the Waterfront Plan would not result in greater development density within the Waterfront Plan area compared to what is allowed under existing zoning since no changes are proposed to the existing zoning and height and bulk regulations.

Table 4-1, p. 4-5 of Draft EIR Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, presents the housing unit, population, and employment information for the Plan area in 2020 and the assumed growth in 2050. The 2020 existing conditions for the Plan area includes 410 housing units, approximately 850 residents, and approximately 12,910 jobs. Growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 550 additional residents, and approximately 14,800 additional jobs. Therefore, the existing conditions plus growth assumed with implementation of the Waterfront Plan would total 670 housing units, approximately 1,380 residents, and approximately 27,700 jobs.

The Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur in regional growth forecasts. For the city, the number of households and the number of jobs is projected to increase by approximately 101,000 and 191,000, respectively, during the period from 2010 to 2040 (see Growth Anticipated in Local and Regional Plans, above). Therefore, by allowing for more density within the Waterfront Plan area, as well as accommodating the growth that is projected to occur within the city, development that could occur pursuant to the Waterfront Plan would alleviate development pressure elsewhere in the city and promote density in the already urbanized and primarily transit-rich Waterfront Plan area. Although the Waterfront Plan could result in approximately 14,800 additional jobs in the Plan area, this would account for only approximately 8 percent of the total projected increase in jobs by 2040. Conservatively assuming that all of the employment-related growth attributable to the Waterfront Plan were to require housing in the city, the employment growth would account for only approximately 7 percent of the projected

increase in households.[19] As such, induced population growth and employment-related housing attributable to the Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur. Therefore, the Waterfront Plan would not induce substantial unplanned population growth beyond that projected by regional forecasts, either directly or indirectly.

The Waterfront Plan also would not trigger a need for roadway expansion or result in the extension of infrastructure into previously unserved areas. Therefore, the Waterfront Plan would not induce substantial unplanned population growth beyond that projected by regional forecasts, either directly or indirectly. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact PH-2: The Waterfront Plan would not displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing outside of the Plan area. ***(Less than Significant)***

The Waterfront Plan would not immediately result in new development. Subsequent projects that could occur pursuant to the Waterfront Plan would be located either on surface parking lots or primarily undeveloped areas of piers, such as Piers 30–32 or the Pier 70 Triangle site. Therefore, no people or housing units would be displaced as a result of the development that could occur pursuant to the Waterfront Plan. As such, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-PH-1: The Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact related to population and housing. ***(Less than Significant)***

Housing and employment growth in San Francisco is consistent with the projections contained in Plan Bay Area 2050, which is the current Regional Transportation Plan/Sustainable Communities Strategy that was adopted by MTC and ABAG in October 2021, in compliance with California's governing GHG reduction legislation, SB 375. Plan Bay Area calls for an increasing percentage of bay area growth to occur as infill development in areas with good transit access and where the services necessary for daily living are provided in proximity to housing and jobs. With its abundant transit service and mixed-use neighborhoods, San Francisco is expected to accommodate an increasing share of future regional growth. Therefore, the Plan Bay Area projections represent the context for the cumulative analysis.

The Waterfront Plan would not immediately result in new development. The overarching goals of the Waterfront Plan are to preserve and enhance the waterfront's function as a maritime port, enhance public access and open space along the waterfront, ensure high-quality new development while preserving the waterfront's historic character, ensure accessible and safe transportation and mobility for people and goods, and strengthen the Port's resilience to climate change impacts. Therefore, the subsequent projects that could occur pursuant to the Waterfront Plan would not (1) induce unplanned population growth beyond that

[19] Assumes 2.08 persons per household based on an average of the persons per household for the census tracts located within Port-owned property (Census Tracts 101, 105, 226, 231.03, 607, 615, and 9809), Selected Housing Characteristics, ACS 2015-2019, 5-Year, Table DP04, California & San Francisco.

projected and (2) would not directly displace housing or necessitate the construction of replacement housing outside of the Waterfront Plan area. Therefore, subsequent projects pursuant to the Waterfront Plan would not combine with the cumulative projects identified in Chapter 4, p. 4-8, of the Draft EIR, to result in a cumulative impact. The cumulative projects include residential mixed-use projects that would increase the overall residential and employment population of the project area. However, this planned growth is consistent with regional projections.

For these reasons, subsequent projects that could occur pursuant to the Waterfront Plan, in combination with cumulative projects, would not result in a cumulative population and housing impact. Accordingly, cumulative impacts related to population and housing would be ***less than significant***.

Mitigation: None required.

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4. Cultural Resources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
4. CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5, including those resources listed in article 10 or article 11 of the San Francisco Planning Code?	☒	☐	☐	☐	☐
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to §15064.5?	☐	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	☐

Impact CR-1: The Waterfront Plan could cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines section 15064.5. ***(Potentially Significant)***

The Waterfront Plan could cause a substantial adverse change in the significance of a historic resource; therefore, this topic is addressed in Section 4.B, Historic Resources, of the Draft EIR. A significant impact would occur if a project would cause a substantial adverse change to a historic resource through physical demolition, destruction, relocation, or alteration of the resource.

This initial study addresses archeological resources and human remains. Impact CR-2 addresses the impacts of the Waterfront Plan on archeological resources, including both Native American and historic archeological resources. Impact CR-3 addresses the impacts of the Waterfront Plan on human remains. Impact C-CR-2 addresses the cumulative impacts of projects in the vicinity on archeological resources and human remains.

REGULATORY FRAMEWORK

The following section summarizes the plans and policies of federal, state, and local agencies that have regulatory oversight with regard to archeological resources—inclusive of archeological resources and human remains—within the Waterfront Plan area.

FEDERAL REGULATIONS

Although subsequent projects that could occur pursuant the Waterfront Plan are not anticipated to require compliance with National Historic Preservation Act section 106, the National Register of Historic Places (National Register) and federal guidelines related to the treatment of cultural resources are relevant for the purposes of determining whether archeological resources, as defined under CEQA, are present and guides the treatment of such resources.

California implements the National Historic Preservation Act through its statewide comprehensive cultural resource preservation programs. The California Office of Historic Preservation, an office of the California Department of Parks and Recreation, implements policies of the National Historic Preservation Act on a statewide level. The California Office of Historic Preservation also maintains the California Historical Resources Inventory. The State Historic Preservation Officer is an appointed official who implements historic preservation programs within the state's jurisdiction.

NATIONAL HISTORIC PRESERVATION ACT AND NATIONAL REGISTER OF HISTORIC PLACES

Cultural resources are protected through the National Historic Preservation Act (16 U.S. Code 470f), Archeological and Historic Preservation Act of 1974, and the Archeological Resources Protection Act of 1979. The National Historic Preservation Act requires project review for effects on historic properties only when projects involve federal funding or permitting, or occur on federal land; therefore, it is not applicable to discretionary actions at the municipal level. However, the National Historic Preservation Act establishes the National Register, which provides a framework for resource evaluation and informs the process of determining impacts on archeological resources under CEQA.

The National Register is the nation's official comprehensive inventory of historic properties. Administered by the National Park Service, the National Register includes buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archeological, or cultural significance at the national, state, or local level. Typically, a resource that is more than 50 years of age is eligible for listing in the National Register if it meets any one of the four eligibility criteria and retains sufficient historic integrity. A resource less than 50 years old may be eligible if it can be demonstrated that it is of "exceptional importance" or a contributor to a historic district. National register criteria are defined in *National Register Bulletin Number 15: How to Apply the National Register Criteria for Evaluation*.

A structure, site, building, district, or object would be eligible for listing in the National Register if it can be demonstrated that it meets at least one of the following four evaluative criteria:

- **Criterion A (Event):** Properties associated with events that have made a significant contribution to the broad patterns of our history;
- **Criterion B (Person):** Properties associated with the lives of persons significant in our past;

- **Criterion C (Design/Construction):** Properties that embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values; or represent a significant distinguishable entity whose components lack individual distinction; and
- **Criterion D (Information Potential):** Properties that have yielded, or may be likely to yield, information important in prehistory or history.

A resource can be significant to American history, architecture, archeology, engineering, and/or culture at the national, state, or local level. In addition to meeting at least one of the four criteria, a property or district must retain integrity, meaning that it must have the ability to convey its significance through the retention of seven aspects, or qualities, that, in various combinations, define integrity:

- **Location:** Place where the historic property was constructed;
- **Design:** Combination of elements that create the form, plans, space, structure, and style of the property;
- **Setting:** The physical environment of the historic property, inclusive of the landscape and spatial relationships of the buildings;
- **Materials:** The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form the historic property;
- **Workmanship:** Physical evidence of the crafts of a particular culture or people during any given period in history;
- **Feeling:** The property's expression of the aesthetic or historic sense of a particular period of time; and
- **Association:** Direct link between an important historic event or person and a historic property.

Properties that are listed in the National Register, as well as properties that are formally determined to be eligible for listing in the National Register, are automatically listed in the California Register of Historical Resources (California Register) (see below) and, thus, are considered historic resources under CEQA. Historic resources, that is, resources found to be significant under California Public Resources Code, as generally the equivalent of historic properties, determined eligible under federal law.

STATE REGULATIONS

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historic resources of the state and indicating which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Public Resources Code section 5024.1(a)). The California Register criteria are based on the National Register criteria (Public Resources Code section 5024.1(b)). Certain resources are determined by CEQA to be automatically included in the California Register, including California properties formally eligible for or listed in the National Register. To be eligible for the California Register as a historical resource, a resource must be significant at the local, state, and/or federal level under one or more of the following criteria:

- **Criterion 1 (Events):** Resources that are associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the U.S.;

- **Criterion 2 (Persons):** Resources that are associated with the lives of persons important to local, California, or national history;
- **Criterion 3 (Design/Construction):** Resources that embody the distinctive characteristics of a type, period, region, or method of construction; represent the work of a master; or possess high artistic values; or
- **Criterion 4 (Archeological/Source of New Information):** Resources or sites that have yielded or have the potential to yield information important to the prehistory or history of the local area, California, or the nation.

As with the National Register, a significant historic resource must possess integrity in addition to meeting the significance criteria in order to be considered eligible for listing in the California Register. Consideration of integrity for evaluation of California Register eligibility follows the definitions and criteria from National Park Service *National Register Bulletin 15*.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA, as codified in Public Resources Code section 21000 et seq. and implemented by the CEQA Guidelines, is the principal statute governing environmental review of projects in California. As stated above, CEQA defines a historical resource as a resource listed in, or eligible for listing in, the California Register; included in a qualifying local register; or determined by lead agency to be historically significant. In order to be considered a historical resource, a resource must generally be at least 50 years old; when acting as CEQA lead agency, the department uses a threshold of 45 years. Public Resources Code section 21084.1 and CEQA Guidelines section 15064.5 define a historical resource for purposes of CEQA.

CEQA requires lead agencies to determine if a proposed project would have a significant effect on important historic resources or unique archeological resources (defined below). A significant impact would occur if a project would cause a substantial adverse change to a resource through physical demolition, destruction, relocation, or alteration of the resource. If an archeological site does not meet the CEQA Guidelines criteria for a historical resource, it may still meet the threshold of Public Resources Code section 21083.2 which defines unique archeological resources. A unique archeological resource is an archeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets one or more of the following criteria:

- Contains information needed to answer important scientific research questions, and that there is a demonstrable public interest in that information.
- Has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person (Public Resources Code section 21083.2(g)).

The CEQA Guidelines note that if a resource is neither a unique archeological resource nor a historical resource, the effects of the project on that resource shall not be considered a significant effect on the environment (CEQA Guidelines section 15064.5(c)(4)). In addition, projects that comply with the Secretary of the Interior's Standards for Rehabilitation (Secretary's Standards) benefit from a regulatory presumption under CEQA that they would have a less-than-significant impact on a historical resource (14 CCR 15126.4(b)(1)). Projects that do not comply with the Secretary's Standards may or may not cause a substantial adverse change in the

significance of a historical resource and must be subject to further analysis in order to assess whether they result in material impairment of a historical resource's significance.

TREATMENT OF HUMAN REMAINS

Under state law, human remains and associated burial items may be significant resources in two ways. They may be significant to descendant communities because of lineage connections or for patrimonial, cultural, lineage, or religious reasons, and they may be important to both the descendant communities and the scientific community (e.g., historians, prehistorians, epidemiologists, physical anthropologists and ethnographers) for their potential to provide significant information about Native American and post-European contact populations. The specific rights of descendant groups with respect to the treatment of ancestral burials is a matter of law, such as for Native Americans, laws pertaining to Native American Historical, Cultural, and Sacred Sites (CEQA Guidelines section 15064.5(d); Public Resources Code section 5097.98). The concerns of the associated descendant group regarding the appropriate treatment and disposition of discovered human burials may become known only through outreach. Decisions concerning appropriate treatment, study, and disposition of human remains and associated burial items may be considered only through consultation between the project sponsor and descendant and scientific communities, and arrived at only with the concurrence of descendant communities.

With respect to the potential discovery of human remains, California Health and Safety Code section 7050.5 states that any person who knowingly mutilates or disinters, wantonly disturbs, or willfully removes any human remains in or from any location other than a dedicated cemetery without authority of law is guilty of a misdemeanor, except as provided in Public Resources Code section 5097.99. Also, knowing or willful possession of Native American human remains or artifacts taken from a grave or *cairn*[20] is a felony under California law (Public Resources Code section 5097.99). The provisions of this subdivision shall not apply to any person carrying out an agreement developed pursuant to Public Resources Code section 5097.94, subdivision (l), or any person authorized to implement Public Resources Code section 5097.98.

CEQA, and other state regulations concerning Native American human remains, provide the following procedural requirements to assist in avoiding potential adverse effects on human remains, within the context of their value to both descendant communities and the scientific community:

1) When an initial study identifies the existence of Native American human remains or probable likelihood that a project would affect Native American human remains, the lead agency is to contact and work with the appropriate Native American representatives identified through the Native American Heritage Commission to develop an agreement for the treatment and disposal of the human remains and any associated burial items (CEQA Guidelines section 15064.5(d), Public Resources Code section 5097.98).

2) In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, the project head foreman and/or project sponsor shall immediately notify the county coroner (in San Francisco, the Medical Examiner). In San Francisco, the department Environmental Review Officer also shall be notified. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie remains until the coroner of the county in which the human remains were discovered has determined, in accordance with Government Code title 3, division 2, part 3, chapter 10 (commencing with section 27460), that the remains are not subject to the provisions of Government Code section 27491 or any other related provisions of law concerning investigation of the circumstances,

[20] A *cairn* is a mound or rough stones built as a memorial or landmark.

manner, and cause of any death and the recommendations concerning the treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Public Resources Code section 5097.98.

a) If the coroner determines that the remains are not subject to his or her authority and recognizes the human remains to be those of a Native American or has reason to believe that they are those of a Native American, he or she shall contact, by telephone within 24 hours, the Native American Heritage Commission (California Health and Safety Code section 7050.5).

b) After notification, following the procedures outlined in Public Resources Code section 5097.98, the Native American Heritage Commission identifies and notifies the most likely descendant, shall make recommendations for treatment of the remains within 48 hours of being granted access to the discovery. Also, knowing or willful possession of Native American human remains or artifacts taken from a grave or cairn is a felony under California law (Public Resources Code section 5097.99).

ENVIRONMENTAL AND GEOLOGIC SETTING

The Port of San Francisco's waterfront extends along 7.5 miles of San Francisco Bay. The three Northern Waterfront subareas, Fisherman's Wharf, Northeast Waterfront, and South Beach, share a similar character and land use history. The historic finger piers and bulkhead buildings of the Embarcadero Historic District are defining elements that span all three subareas. The two Southern Waterfront subareas, Mission Bay and Southern Waterfront, include China Basin/Mission Creek to the north and Port properties that extend south to Heron's Head Park at India Basin. The Southern Waterfront subareas also include a variety of maritime operations including harbor services, ferries and cargo shipping, along with waterfront parks and direct bay access; new mixed-use neighborhoods; commercial, residential, and recreational uses; and light industrial activities.

A critical element of the Plan area's environmental setting and geologic context is prehistoric sea-level rise and the filling of San Francisco Bay. When Native Americans first occupied the region more than 10,000 years ago, San Francisco Bay did not yet exist because the Pacific Ocean was about 130 feet lower than today. Over the following several thousand years, during the Middle Holocene (7,650–3,750 BP) and into the Late Holocene (3,750 BP onward), rising sea level transformed the terrestrial landscape of the San Francisco Bay into the tidal estuary and marsh that exists now. When inundation occurred, bay and estuary deposits (commonly referred to as Young Bay Mud) were deposited on top of the pre-bay landforms. As a result, a sizable part of the landscape that was previously available for the earliest human use and occupation of the region is now submerged below the waters and wetlands of San Francisco Bay—and in many cases also buried by artificial fill placed in the bay and marshes historically to create habitable surfaces for modern development along the shoreline. Any attempt to assess Native American archeological sensitivity in the Plan area must take into account the timing and extent of these large-scale landscape changes caused by rising sea levels in the Middle and Late Holocene and, thus, the potential for project work to encounter deeply buried and submerged archeological resources.[21]

The Northern Waterfront subarea encompasses generally gently eastward-sloping to flat areas along the eastern waterfront of San Francisco that were open water prior to being artificially filled during the 19th and 20th centuries. The depth and composition of artificial fill varies along the waterfront, but the fill generally

[21] Kaijankoski, Philip, Brian F. Byrd, and Jack Meyer, *A Geoarcheological Study of the Islais Creek Estuary: A Framework for Future Project-Specific Archeological Investigations at the Southeast Water Pollution Control Plant, San Francisco, California*, prepared for the San Francisco Public Utilities Commission, 2016.

overlies Young Bay Mud. The Young Bay Mud thickness underlying the artificial fill generally increases away from the historic shoreline. In many places, Young Bay Mud is underlain by the Colma Formation (or, where the Colma is absent, the Upper Layered Sediments stratum), which in turn is underlain by bedrock. The depth to bedrock varies widely in the Plan area, from approximately 50 feet below ground surface (bgs) to nearly 200 feet bgs, and the depth to overlying deposits is similarly variable.[22] For archeological resources, the depth of the Young Bay Mud is important; the upper Young Bay Mud itself has the potential to contain historic period maritime resources and the base of the Young Bay Mud has the potential for submerged Native American resources that predate inundation of the bay.

In the Southern Waterfront subarea, thinner layers of artificial fill are underlain by Jurassic-age serpentinite bedrock of the Franciscan Complex. In Mission Bay, artificial fill overlies Young Bay Mud then, variably, the Colma Formation or alluvial deposits derived from the Colma, with bedrock below the Colma. Around Potrero Point, Young Bay Mud under the fill may be very thin or absent, with fill directly overlying bedrock. At Islais Creek, fill may be very thick, as may Young Bay Mud. Farther south in the Plan area, a regulated modern landfill is within the Piers 90–94 Backlands, underlying the northern portion of the Pier 94 staging areas.[23] The modern landfill is covered with a soil cap of additional artificial fill consisting of 2.5 to 8 feet of loose to very dense sands and gravels with variable amounts of clay and silt, and occasional concrete, brick, and serpentinite fragments.

The Colma Formation was deposited terrestrially during the Pleistocene Epoch as stabilized dune sands and was the exposed land surface during the Early to Middle Holocene when humans first inhabited the San Francisco Peninsula.[24] Depending on the location, the Colma Formation was subsequently buried by Middle to Late Holocene dune deposits (in terrestrial environments) or by Middle to Late Holocene Bay Deposits (that is, Young Bay Mud) (in marine environments). As Byrd and others note about the Colma Formation on the San Francisco Peninsula:

> *Since this is the landscape that was first encountered and used by the earliest inhabitants [before Middle Holocene sea level rise], any archeological materials from this period will be located at or near the top of the Colma deposits and not buried by them, which is why these deposits represent the "cultural basement," both temporally and stratigraphically.*[25]

If intact and not previously eroded, approximately the upper 3 feet of the Colma Formation is considered sensitive for Middle Holocene (7,650 to 3,750 BP) archeological deposits in San Francisco.

PREHISTORIC ARCHEOLOGICAL CONTEXT

The following discussion outlines the Native American context of the Waterfront Plan area, including a recent chronology for Native American archeological sites on the San Francisco Peninsula and the San Francisco Bay Area. This section has been adapted from the *Archeological Technical Memorandum for the San Francisco*

[22] CH2M and Arcadis, *Port of San Francisco Waterfront Resilience Program Multi-Hazard Risk Assessment Northern Waterfront and Embarcadero Seawall Summary Report*, Prepared for Port of San Francisco, August 2020.
[23] Treadwell & Rollo/RYGC, a Joint Venture, *Geotechnical Investigation, Pier 94 Backland Improvements, San Francisco, California*, July 5, 2012.
[24] Schlocker, Julius, Geology of the San Francisco North quadrangle, California: U.S. Geological Survey, Professional Paper 782, 1974.
[25] Byrd, Brian F., Philip Kaijankoski, Jack Meyer, Adrian Whitaker, Rebecca Allen, Meta Bunse, and Bryan Larson, *Archeological Research Design and Treatment Plan for the Transit Center District Plan Area, San Francisco, California*, prepared by Far Western Anthropological Research Group, Past Forward, Inc., and JRP Historical for the City and County of San Francisco Planning Department, San Francisco, CA, 2010, p. 82.

General Plan Housing Element EIR.[26] Comprehensive discussions on the prehistory of San Francisco and the bay area are also provided by Milliken and others[27] and Byrd and others.[28]

Since the late Pleistocene, when indigenous peoples may have first arrived in the bay area, the region has undergone significant environmental changes. The oldest evidence of human occupation in San Francisco includes two isolated human skeletons discovered 45 years apart deep below city streets in marine deposits. In October 1969, fragmentary human bones were encountered during construction of the Bay Area Rapid Transit (BART) Civic Center Station in downtown San Francisco. Recorded as site CA-SFR-28, those remains belonged to a female individual aged 24 to 26 years. Radiocarbon dating of associated organic material indicated the remains were nearly 5,000 years old. The skeleton was discovered 75 feet below ground surface (bgs) within a 40-foot-thick clayey silt stratum (bay deposits), approximately 26 feet below mean sea level.[29] More recently, an intact human skeleton was found during construction of the Transbay Transit Center in February 2014. The human remains (CA-SFR-205) were encountered at a depth of 55 feet bgs at the interface of Young Bay Mud and overlying marine sands and are estimated to be approximately 7,600 years old.[30] In addition to CA-SFR-28 and -205, other San Francisco sites of notable antiquity include a cryptocrystalline silicate flake fragment recovered by Kaijankoski and others deeply buried (48 to 52 feet bgs) under Holocene bay deposits beneath San Francisco's Southeast Water Pollution Control Plant.[31] Based on sedimentary context, that flake appears to be nearly 7,000 years old, and is presumed to be an isolated artifact inundated as the San Francisco Bay formed. Subsequent discoveries include a submerged midden component of CA-SFR-171 at the Southeast Water Pollution Control Plant dating to approximately 3,860–3,700 BP,[32] and a submerged midden on Mission Bay (CA-SFR-220), which dates to approximately 7,900 BP.[33] Another site, CA-SFR-004/H, on Yerba Buena Island, included a submidden cemetery dating to approximately 3,400 BP.[34] These finds are exceptional, as the majority of known Native American-era sites in San Francisco are no more than 2,000 years old and are found buried at depths of approximately 10 to 12 feet bgs. Most recorded Native American sites were originally deposited within sand dune sands that were blown eastward from the Pacific coast, across the peninsula, over the last 6,000 years.

Native American resources and sites that have survived to the present represent only a portion of the past. The early growth of San Francisco was characterized by filling the shallow bay waters and other low-lying lands,

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[26] William Self Associates (WSA) and Randall Dean, *Archeological Technical Memorandum for the San Francisco General Plan Housing Element EIR*, Prepared for San Francisco Planning Department, 2009.

[27] Milliken, Randall, Richard T. Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottfield, Donna Gillette, Vaviana Bellifemine, Eric Strother, Robert Cartier, and David A. Fredrickson, Punctuated Culture Change in the San Francisco Bay Area, in *Prehistoric California: Colonization, Culture, and Complexity*, T.L. Jones and K.A. Klar, editors, pp. 99–124, AltaMira Press, 2007.

[28] Byrd, Brian F., Philip Kaijankoski, Jack Meyer, Adrian Whitaker, Rebecca Allen, Meta Bunse, and Bryan Larson, *Archeological Research Design and Treatment Plan for the Transit Center District Plan Area, San Francisco, California*, prepared by Far Western Anthropological Research Group, Past Forward, Inc., and JRP Historical, Prepared for the City and County of San Francisco Planning Department, San Francisco, CA, 2010.

[29] Henn, Winfield, Tom Jackson, and Julius Schlocker, "Buried Human Bones at the 'BART' Site San Francisco," *California Geology*, Vol. 25, No. 9, pp. 208–209, 1972.

[30] William Self Associates, Inc. (WSA), Department of Parks and Recreation Site Records for CA-SFR-205. On file, Northwest Information Center, Sonoma State University, Rohnert Park, CA, 2018.

[31] Kaijankoski, Philip, Brian F. Byrd, and Jack Meyer, *A Geoarcheological Study of the Islais Creek Estuary: A Framework for Future Project-Specific Archeological Investigations at the Southeast Water Pollution Control Plant, San Francisco, California*, prepared for the San Francisco Public Utilities Commission, 2016.

[32] Kaijankoski, Philip and Brian F. Byrd, *Prehistoric Archeological Testing Report of CA-SFR-171 for the Biosolids Digester Facilities Project, Southeast Water Pollution Control Plant, San Francisco, California*, prepared by Far Western Anthropological Research Group, Inc. for the San Francisco Public Utilities Commission, 2017.

[33] Rehor, Jay, Department of Parks and Recreation Site Record for CA-SFR-220. On file at the Northwest Information Center, Sonoma State University, CA, 2020.

[34] Morgan, S. S. and S.D. Dexter, *San Francisco-Oakland Bay Bridge East Span Seismic Safety Project: Archeological Analysis of CA-SFR-4/H, Yerba Buena Island, San Francisco & Alameda Counties, California*. Report submitted to the California Department of Transportation by Parson Brinkerhoff. Prepared by URS Corporation, 2008.

removing hills of sand and rock, and obscuring the original ground surfaces by fill, roadways, buildings, and structures. Nels C. Nelson conducted a systematic survey around the perimeter of the entire San Francisco Bay between 1906 and 1909, focusing on shellmounds partially submerged by or adjacent to the bay waters. Although Nelson recorded 425 shellmounds around the San Francisco Bay Area, his survey occurred well after the city and other areas were heavily developed and covered by the built environment, obscuring sites now known to have been present.[35] Archeological discoveries in San Francisco since the 1980s demonstrate that both late-19thand early-20th century land reclamation, and wind-driven dune migration along San Francisco's bay shoreline, obscured evidence of Native American shellmounds before the time of the Nelson survey.

Periods of prehistory and discovered sites dating from these periods are discussed below.

TERMINAL PLEISTOCENE (13,450–11,550 YEARS BEFORE PRESENT [B.P.])

No Native American archeological sites dating from this period have yet been discovered in the San Francisco Bay Area. The nearest known Terminal Pleistocene site is the Borax Lake site (CA-LAK-36), located in Lake County, more than 130 miles to the north of San Francisco. Populations at this time were small and highly mobile. The archeological signature of what are believed to have been small, highly mobile hunter-gatherers would be expected to be faint and geographically sparse, and thus would be easily obscured or disturbed by geological processes such as erosion, rising sea level, and alluvial burial.

EARLY HOLOCENE (11,550–7,650 B.P.)

Early Holocene human populations are known from several bay area sites, such as those at the Los Vaqueros Reservoir (CA-CCO-696) and the Santa Clara Valley (CA-SCL-178). Communities from this period were semi-mobile hunter-gatherers who used flaked stone tools and ground stone implement such as handstones and milling slabs. Human burials from this period have also been investigated. SFR-220, a submerged Native American shell midden, is the only known Early Holocene site in San Francisco. SFR-205, a deeply buried human burial, marginally postdates this period.

MIDDLE HOLOCENE (7,650–3,750 B.P.)

Middle Holocene archeological sites are more widespread in the San Francisco Bay Area and are evidenced by substantial settlements, isolated burials, distinct cemeteries, milling slabs, mortars and pestles, and the fabrication and use of shell beads and other ornaments. Differences in burial treatment such as differential distribution of shell beads and ornaments are interpreted as evidence of possible social stratification. The expansion of San Francisco Bay's estuaries and tidal wetlands seems to have resulted in a shift from terrestrial hunting and gathering toward coastal and maritime resource exploitation. In San Francisco, this period is represented by the two deeply buried, isolated human skeletons described above, the isolate flaked stone fragment at the Southeast Water Pollution Control Plant, a deeply buried and submerged midden on Mission Bay and possibly, the submerged component of CA-SFR-171, on Islais Creek, are the only known Middle Holocene resources in San Francisco. However, it can be assumed that additional cultural remains dating to this period are present in San Francisco, deeply buried under fill and sediments, and likely submerged beneath San Francisco Bay.

[35] Nelson, Nels C., "Shellmounds of the San Francisco Bay Area," *University of California Publications in American Archeology and Ethnology* 7 (4):310–356, Berkeley, CA, 1909.

LATE HOLOCENE (3,750–170 B.P.)

The most comprehensive archeological record of Native American populations in San Francisco dates to the Late Holocene. This period is marked by the establishment of large shellmounds. Artifact assemblages are characterized by bone awls (indicating appearance of coiled basketry); net sinkers; mortars (probably indicating greater consumption of acorns and other plant resources); *Olivella* shell beads; the appearance of the bow and arrow; and diverse beads and ornaments, such as incised bird bone tubes. There is some indication of a greater exploitation of deer, sea otter, mussels, and clams. In some locations around the bay, there is evidence that shellmounds—large extensive accumulations of shell midden, may represent planned, constructed landscapes on sites of mortuary, and possibly ancestral, importance.[36] No massive shellmounds on the scale of the Emeryville and West Berkeley mounds of the East Bay are present in San Francisco today, but such sites may have been present prior to modern development. CA-SFR-07, near Hunters Point, which was investigated by Nelson in 1907, may have been one such site.

NATIVE AMERICAN ARCHEOLOGICAL INVESTIGATIONS IN SAN FRANCISCO

Systematic investigation of Native American sites on the northern San Francisco peninsula began with Nelson's shellmound survey conducted between 1906 and 1909.[37] Nelson pursued his interest in San Francisco prehistory with excavations at CA-SFR-7 (the Crocker Mound), a 10-foot deep shellmound near Hunters Point, on the bay's southeastern shoreline south of the Plan area, among other investigations.[38] Nelson found that CA-SFR-7 contained a variety of flaked stone, worked bone, faunal remains, and 23 human burials. Nelson interpreted the constituents of this mound to represent a long-term residential occupation. Two years later, L. L. Loud excavated another shellmound (CA-SFR-6), approximately 3 feet thick, near the Palace of Fine Arts northwest of the Plan area.[39] While interest in the prehistory of the northern San Francisco Peninsula began in the 1850s, when several shellmounds were mapped along the route of the San Bruno Turnpike Road (Gabbri 1858), San Francisco archeology generally received little attention until the last few decades of the 20th century. This was partially a result of the destruction and/or burial of sites during historic-era settlement and development.

Within the past 40 years, the body of work focusing on the Native American archeology of the northern San Francisco Peninsula has expanded substantially, as archeological sites have been uncovered during construction or development activities within the city. Approximately 25 Native American archeological sites have been documented within the northern San Francisco peninsula and Yerba Buena Island; the majority of these were within one-half mile or less of the historic-era margins of the San Francisco Bay. Other Native American archeological sites in the vicinity of the Plan area include CA-SFR-112 and CA-SFR-135 west of the Plan area and CA-SFR-193/H to the southeast. Also in the plan vicinity is CA-SFR-28, which consists of deeply buried human remains encountered 75 feet bgs near Civic Center BART station, southwest of the Plan area; CA-SFR-205, the deeply buried human remains encountered south of the Plan area,[40] and SFR-220, a deeply

[36] Lightfoot, Kent G., "Cultural Construction of Coastal Landscapes: A Middle Holocene Perspective from San Francisco Bay," in *Archeology of the California Coast during the Middle Holocene*, Jon M. Erlandson and Michael A. Glassow, editors, pp. 129–141, *Perspectives in California Archeology* Vol. 6, Cotsen Institute of Archeology, University of California, Los Angeles, 1997; Lightfoot, Kent G., and Edward M. Luby, "Late Holocene in the Greater San Francisco Bay Area: Temporal Trends in the Use and Abandonment of Shell Mounds in the East Bay," in *Catalysts to Complexity: The Late Holocene on the California Coast*, Jon M. Erlandson and Terry Jones, editors, pp. 263–281, Cotsen Institute of Archeology, University of California, Los Angeles, 2002.
[37] Nelson, Nels C., "Shellmounds of the San Francisco Bay Area," *University of California Publications in American Archeology and Ethnology* 7 (4):310–356, Berkeley, CA, 1909.
[38] Moratto, M. J., *California Archeology*, Academic Press, Orlando, FL, 1984.
[39] Ziesing, Grace H., *Replacement of the West Approach to the San Francisco-Oakland Bay Bridge: Archeological Research Design and Treatment Plan*, prepared for California Department of Transportation, District 4, Oakland, CA, 2000.
[40] Henn, Winfield, Tom Jackson, and Julius Schlocker, "Buried Human Bones at the 'BART' Site San Francisco," *California Geology*, Vol. 25, No. 9, pp. 208–209, 1972.

buried and submerged Native American occupation deposit near the pre-development mouth of Mission Creek. This last, dated at 7,900 years old, is the oldest know Native American archeological site in San Francisco. With the exception of isolate humans remains and other isolates, all of the Native American sites recorded in San Francisco are shell midden sites. These have their apparent greatest concentrations in the South of Market neighborhood and the Hunters Point-Bayview-Candlestick Point-Visitacion Valley area. Although midden sites in the latter area have been known since the 1850s and include some of the largest sites in San Francisco, few have not been thoroughly investigated and or dated. The South of Market sites have, on the other hand, largely only come to light since the 1980s and have been subject to various modern analyses and absolute dating techniques. These shell midden sites are also remarkable within bay area archeological studies because many of them have retained good physical integrity due to having been deeply buried beneath natural sand dune deposits prior to the advent of modern development, which protected many deposits from post-depositional disturbance.

The Anthropological Studies Center (ASC) at Sonoma State University proposed an archeological district, "Prehistoric Native American Shell Middens on Mission Bay," that incorporates several Native American sites within sand dunes formed along the north side of Mission Bay in the South of Market neighborhood.[41] ASC interpreted these sites as elements of a large multi-village community. The California State Historic Preservation Officer (SHPO) determined that at least seven previously recorded Native American habitation sites (CA-SFR-2, -113, -114, -147, -155, -154/H, and -175) are contributors to this district, although no formal boundaries have been developed; several other shell middens found subsequently may also be elements of this district. The district was determined by the SHPO to be eligible for the National Register under Criterion A, as "associated with events that have made a significant contribution to the broad patterns of our history."[42] In addition, site CA-SFR-175 was also determined to be individually eligible under Criterion D for its ability to yield important new insights into regional prehistory in the vicinity of Mission Bay.[43] The district may be expanded and formalized as new resources in the vicinity of Mission Bay are identified and evaluated.

In addition to the South of Market neighborhood and the Hunters Point-Bayview-Candlestick Point-Visitacion Valley area, a third area of intense Native American occupation in and adjacent to the Plan area was on the terraces of the former Islais and Precita creeks, just above their broad tidal estuary south of the Plan area. One notable site that has been investigated in this area is CA-SFR-171, a site at the Southeast Water Pollution Control Plant. Far Western Anthropological Research Group, Inc. (Far Western) conducted testing at CA-SFR-171 in June 2016 to define the extent of the buried site, which consisted of drilling 30 hydraulic continuous cores at roughly 50-foot intervals across the site boundaries to depths ranging from 12 to 41 feet bgs. Coring was followed by stratigraphic analysis, wet screening and flotation processing of identified cultural deposits. Far Western identified Native American archeological materials in several cores in a variety of contexts including thin terrestrial midden, thick terrestrial midden, submerged midden, naturally reworked midden, and artificially redeposited midden. Results indicate the earliest occupation, represented by the submerged midden deposit, extends as early as 3860 B.P., near the end of the Middle Holocene.[44]

Other concentrations of Native American occupation on the San Francisco Peninsula include the northern bayshore and Lake Merced. Native American sites documented along the northern bayshore (CA-SFR-23, -26,

[41] ASC (Anthropological Studies Center), *Site-Specific Archeological Research Design, Evaluation, and Data Recovery and Treatment Plan for Prehistoric Midden Deposits at Fourth and Howard Streets, San Francisco*, prepared for the San Francisco Municipal Transportation Agency, September 15, 2010.
[42] Ibid.
[43] Ibid.
[44] Kaijankoski, Philip and Brian F. Byrd, *Prehistoric Archeological Testing Report of CA-SFR-171 for the Biosolids Digester Facilities Project, Southeast Water Pollution Control Plant, San Francisco, California*, prepared by Far Western Anthropological Research Group, Inc. for the San Francisco Public Utilities Commission, 2017.

-29, -30, and -129) and Lands End (CA-SFR-5, -20, and -21) appear to be smaller occupation sites or food processing camps. Shell midden sites in the Lake Merced area (CA-SFR-25, -126, and -184) have not been investigated.

ETHNOHISTORIC BACKGROUND

A description of the traditional distribution and traditional cultural lifeways of the Ohlone tribes who resided in San Francisco at the time Spanish colonists arrived in 1776, and their history after the time of colonization, is presented in Section E5, Tribal Cultural Resources.

HISTORIC BACKGROUND

This section presents the Spanish (1776–1820), Mexican (1821–1848), and Gold Rush (1849–1859) periods of San Francisco. Post Gold Rush history is addressed in detail in Section 4.B, Historic Resources, of the Draft EIR.

SPANISH PERIOD (1776–1820)

Explorers' accounts, mission records, and Mexican land records account for most of recorded regional history during the period leading up to the gold rush. The first European expedition into the San Francisco Bay Area occurred in 1769 when Gaspar de Portolá and his party as far north as Sweeny Ridge in modern San Mateo County, becoming the first Europeans to view San Francisco Bay.

Similar to other Spanish settlements in Alta California, colonial San Francisco (known as Yerba Buena) was organized around three frontier institutions: the fortified military garrison or presidio; the mission, the religious component founded by Franciscan padres; and the pueblo, the civilian village. Established in late June 1776, the San Francisco Presidio was situated along the northern edge of the peninsula. The Spanish established Mission San Francisco de Asís (also known as Mission Dolores) in San Francisco in 1776, at a location west and south of the Plan area. Mission Dolores was located on land occupied seasonally by the Yelamu people. Over the next few decades, a small civilian village grew up on the shores of Yerba Buena Cove (at the location of today's San Francisco Financial District), which provided a shipping port for hides and tallow produced by the mission.

Although initial interactions between the Yelamu and the mission fathers and soldiers were positive, the relationship between native people and the newcomers quickly became strained.[45] Nonetheless, the first baptisms of Yelamu neophytes took place at Mission San Francisco de Asís on June 24, 1777. Thirty-one Yelamu, mostly young people, were baptized by the end of that year. More baptisms followed, and a "wave of adult baptisms in 1782, 1783, and 1784 brought most of the Yelamu tribe and all the people of the small Urebure (South San Francisco/San Bruno) and Pruristac (Pacifica) village groups into the Mission San Francisco community." After that, Spanish priests began to recruit other Ohlone groups. Between November 1794 and May 1795, a large wave of Ohlone people were baptized and moved into Missions Santa Clara and Dolores, including 360 people to Mission Santa Clara and entire populations of East Bay villages to Mission Dolores. The reasons that native peoples joined the mission were complicated, but included such considerations as family obligations, a desire to be allied with the apparently powerful newcomers, existing alliances, ecological stress,

[45] Milliken, Randall T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area 1769–1810*, Ballena Press Anthropological Papers, No. 43., Thomas C. Blackburn, editor, Ballena Press, Menlo Park, CA, 1995.

spiritual conversion, and an assessment of the future. Catastrophic epidemics of European diseases, as well as food shortages, resulted in alarming death rates among the mission inhabitants.[46]

Many neophytes fled the missions, returning to their home villages despite efforts by the Franciscan fathers and Spanish soldiers to bring them back to the missions. This had the unfortunate consequence of spreading the European diseases to those who had never left their homes, further decimating the populations of the remaining Ohlone villages. Later epidemics proved equally disastrous to the Ohlone population; it is estimated that one-quarter of San Francisco Bay Area Mission Indians died of measles or related complications in the spring of 1806. Due to introduced European diseases, a declining birth rate and high infant mortality, the bay area-wide Ohlone population decreased from at least 10,000 (pre-contact) to approximately 2,000 by 1832, and no more than 1,000 by 1852.[47]

The Spanish presence significantly disrupted native Californian's lifeways, and the missions of Upper California were never lucrative and not considered a priority by distant Spanish authorities concerned with administering a number of colonial possessions. Following the ceding of Spain's North American colonial outposts to the newly independent Republic of Mexico in 1822, Upper California became, somewhat unwillingly, a province of the Republic of Mexico. With little experience in self-government, and no money to spare for distant territories, Mexico was unable to dedicate more attention to California than its predecessor. It did make some important legal changes that shifted power away from the missions, which under Spain had been granted vast authority, to more secular rule.

MEXICAN PERIOD (1821–1848)

Most of California south of Sonoma was under Mexican rule from 1821 to 1848. In the years following the 1810 Mexican Revolution, political instability added to the deteriorating conditions at (and funding for) the missions. As a result, the Church's power and influence waned during this period. Immigration into and private settlement in the region began in earnest in 1823, as the Mexican government awarded large grants of land to wealthy and politically influential individuals willing to settle in what was still known as Alta California. In 1833 to 1834, the Mexican government secularized the Spanish missions, and many mission lands were subsequently granted to private individuals who established vast cattle raising estates, or ranchos.[48]

A small number of American and British merchants arrived in California during this period. Like their successors, they came to the region for its natural resources, such as hides, tallow, and sea otter and beaver pelts. Accounts like those found in Richard Henry Dana's *Two Years Before the Mast*, published in 1840, stirred Americans' interest in the region. While hide, tallow, and sea otter traders largely arrived by sea, beaver trappers became the first wave of overland American explorers. Men like Jedediah Strong Smith and James Ohio Pattie established routes that would lay the groundwork for future westward migration.[49]

During the 1840s, relations between the United States and Mexico became strained, with Mexico fearing American encroachment into their territories. The political situation became unstable and war between the two nations broke out in 1846. American attempts to seize control of California quickly ensued, and within two months California was taken by the United States. Skirmishes between the two sides continued until California

[46] Ibid.
[47] Ibid.
[48] Rawls, James J., and Walton Bean, *California: An Interpretive History*, 7th edition, McGraw Hill, 1997.
[49] Ibid.

was officially annexed to the United States on February 2, 1848, a date that, fortuitously for the United States, coincided with the beginning of the California gold rush.[50]

GOLD RUSH PERIOD (1849–1859)

The discovery of gold in the Sierra Nevada in January 1848 resulted in a major population increase in northern California as immigrants poured into the territory seeking gold or associated opportunities. Before the gold rush, San Francisco was a small community with a population of approximately 800. With the discovery of gold, there was a sudden influx of thousands of newcomers from across the United States and around the world, and a city of canvas and wood sprang up around Yerba Buena Cove—at the location of today's San Francisco financial district— and on the surrounding sand dunes and hills.

To accommodate the growing population, the city soon spread out in all directions in a rapid and haphazard manner,[51] despite the initial lack of municipal infrastructure, such as roads or water service. By 1850, grading and planking of the city's streets was underway. Even by the late 1840s, before the mass population influx, a shortage of wharfage was already apparent in San Francisco. During the early gold rush period, the rapid and extreme increase in the population service and the vastly increased demand for shipping for goods and people led to a dramatic transformation of the contours of the bay shoreline along the San Francisco waterfront, primarily due to the development of wharves, as described below.

> *Wharf development was one of the most competitive areas of San Francisco's early economy. The city lacking the funds to construct the needed wharfs, the development of San Francisco's wharves was from the beginning proprietary ventures. The wharf-companies sought to maximize their interests by extending wharves as far as possible to reach deep-water and, thus, ocean-going vessels with deep drafts.*[52]

However, many ships were permanently docked at the wharves, as crews intent on seeking gold abandoned ship. In some cases, docked shops were converted into stores or warehouses, and wharves and piers also served as streets. Cross streets were built to interconnect connect the piers. Filling between the wharves, driven by a need for more level land along the waterfront (hemmed in by Russian and Telegraph hills) rapidly extended the city's waterfront eastward out into the bay. Frequent catastrophic fires, some of which burned both the wharves and the ships abandoned at them, led to yet more filling:

> *Soon after the city's many wharves had been built out from the original shoreline of the bay for some distance, cross connecting streets on pilings were erected to join one wharf to the next. Soon, the enclosed areas were filled with sand or other materials and the shoreline began to advance bayward. The amount of filling necessary for a given piece of property was based on the need to bring it to the level of the officially established city grade. Landfill most commonly consisted mostly of dune sand, accessible almost everywhere; other fill included rubbish, building rubble, abandoned ships, or anything else which had no immediate value.*[53]

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[50] Kyle, Douglas E., *Historic Spots in California*, 5th edition, Stanford University Press, Stanford, CA, 2002.
[51] Pastron, Allen G., James P. Delgado, and Emily Wick, *Draft Addendum Archeological Research Design and Treatment Plan for the 8 Washington Street Project, City and County of San Francisco, California*, prepared for Turnstone Consulting, San Francisco, CA, June 2007.
[52] Dean, Randall, *City Front Archeological Research Design and Treatment Plan for the Mid-Embarcadero Surface Roadway Project*, prepared by Holman and Associates, prepared for the City and County of San Francisco, California Department of Transportation, and U.S. Federal Highway Administration, October 1997.
[53] Dow, Gerald Robert, *Bay Fill in San Francisco: A History of Change*, Master's Thesis, Department of History, California State University, San Francisco, CA, 1973.

These changes began and were initially most marked in the central waterfront area, with the filling of Yerba Buena Cove, but over the subsequent decades, similar patterns of development occurred in Mission Bay and around Potrero Point and, in the early 20th century, in the Islais Creek Estuary and along the northern bayshore. They dramatically changed the topography and land base of the city. They also are highly pertinent to the types of archeological resources and submerged and buried cultural resources that could be uncovered in the Waterfront Plan area. These resource types are discussed further below.

ARCHEOLOGICAL SENSITIVITY ASSESSMENT

NATIVE AMERICAN ARCHEOLOGICAL RESOURCES

Native American property types that might be encountered within the Plan area include midden, artifact and/or ecofact scatters, burials, isolated finds, and re-deposited Native American material.[54] Recently, Far Western developed the San Francisco Planning Department's citywide sensitivity model for Prehistoric Resources, a Native American archeological sensitivity model covering the entire city and county of San Francisco.[55] The model addresses sensitivity for surface archeological resources (Native American archeological deposits that tend to occur at or near the present ground surface, or the historic-era surface as it existed before about 1850 A.D., including those that are capped by built structures or covered by artificial deposits), buried archeological resources (land surfaces that were covered by terrestrial sediments, such as alluvium, colluvium, or wind-blown dune sand, subsequent to the formation of the deposit and before the historical period), and submerged archeological resources associated generally with the submerged pre-Middle Holocene (8,200 to 4,200 B.P.) land surface, but potentially submerged much more recently, depending on setting. The sensitivity model is based on a diachronic reconstruction of the bay and ocean shoreline at 1000-year intervals (based on known rate of sea-level rise and pre-bay landform elevations, developed based on bathymetric and geotechnical coring data; degree of slope; proximity to the bay shore, creeks, creek confluences, and other water sources; distance from recorded Native American archeological sites; landform history (e.g., whether an area was subject to alluvial burial or erosion); and available data on areas of extensive historic or modern grading. This modeling suggests that areas located within a 200 to 240-meter (about 650 to 800 feet) radius of a perennial stream channel or lake or of the bayshore) have the highest sensitivity for the presence of Native American archeological resources.[56] This is highly consistent with the historically-documented distribution of Native American archeological sites in San Francisco,[57] and as documented in the confidential San Francisco County archeological records on file at the California Historical Resources Inventory System, Northwest Information Center at Sonoma State University.

In most of the Waterfront Plan area, the pre-development surface has been buried by historic-period fill. Thus, the potential depth of near-surface Native American archeological sensitivity is variable.[58] With the exception of small areas of very high near-surface sensitivity along the Northeast Waterfront and on the Southwest Waterfront north of Potrero Point, the sensitivity model predicts that the Plan area generally has a low sensitivity for near-surface Native American archeological resources. Parts of Potrero Point have varying sensitivity, from low to very high, for buried Native American archeological resources. Buried archeological

[54] Byrd, Brian F., Jack Meyer, Rebecca Allen, Bryan Larson, Chris McMorris, Meta Bunse, *Archeological Research Design and Treatment Plan for the Central SoMa Plan Area, San Francisco, California*, prepared by Far Western Anthropological Research Group, ESA Inc., and JRP Historical, prepared for the City and County of San Francisco Planning Department, San Francisco, CA, 2014.
[55] Meyer, Jack and Paul Brandy, *Geoarcheological Assessment and Site Sensitivity Model for the City and County of San Francisco, California*, prepared by Far Western for the Environmental Planning Division of the San Francisco Planning Department, 2019.
[56] Ibid.
[57] Nelson, N. 1908. Shellmounds of the San Francisco Bay. University of California Publications in Archeology and Ethnography. Berkeley
[58] Near-surface refers to resources that lie on or within a few feet below the pre-development surface.

sensitivity refers to sites buried by natural processes, and generally refers to depths greater than about 3 feet below the pre-development surface. The generally low sensitivity for resources on the historic-period surface is due to the fact that most of the Plan area was within the waters of the bay prior to historic 19th and 20th century landfill. Based on a combination of surficial geology, moderately steep shoreline slopes historically, extensive cutting of steep areas of the original slope, grading of the sand dunes that once covered much of the shore to create level ground and reclaim offshore areas, and intensive industrial development, the potential survival of near surface or buried Native American archeological resources even in the sensitive areas north of Potrero Point may be reduced, although there is still the potential to encounter resources in areas where the historic-period surface is intact. Depth of artificial fill may be assessed through inspection of geotechnical or geoarcheological coring logs, and also based on historic data.

Under certain environmental conditions some submerged geological landforms, if they were exposed at the earth's surface prior to the sea-level rise that created the modern bay during the Middle Holocene (8,200 to 4,200 B.P), are sensitive for preservation of Native American archeological sites. Submerged sensitivity, refers to resources that were submerged prehistorically by the rising bay and then buried by Young Bay Mud bay bottom sediments. Such sites may lie 30 feet or more below the modern surface. As discussed above, progressive sea-level rise throughout the Middle Holocene resulted in deposition of marine sediments on top of landform surfaces that were exposed and available for Native American habitation [59] In the Plan area, Early or Middle Holocene Native American habitation sites may lie deeply buried under both the Young Bay Mud stratum deposited by the rising bay during the Middle Holocene and under landfill placed in the bay to reclaim land during the historic period. Far Western's Native American archeological sensitivity model, discussed above, assumes generally reduced sensitivity for submerged Native American archeological sites in areas inundated more than about 4,000 years ago. As human populations in the area are believed to have been small and widely distributed prior to that time, the model assumes that the potential for encountering sites older than 4,000 years at any given location is low. However, archeologists agree that any such older site would be highly significant due to rarity; sites older than 4,000 years have the potential to provide data about a prehistoric period that is virtually unknown in the bay region. The recent discovery of a 7,900-year-old shell midden submerged and buried under fill and Young Bay Mud in Mission Bay provides evidence that early Middle Holocene sites are present in San Francisco and that at least some such sites have survived inundation by the bay. For these reasons, the planning department extends Far Western's model for high sensitivity for submerged sites to include all areas inundated by 8,000 years ago or later.

Although undetectable from the surface, submerged sites are vulnerable to impacts from new development built atop the artificial fill that overlies Young Bay Mud. Development in such areas generally must be supported on deep piles or soil improvements. Submerged sites are less likely to be encountered at development sites at which Young Bay Mud immediately overlies bedrock, demonstrably marine deposits, or demonstrably eroded surfaces (such as truncated Colma formation); or where a steeply sloped surface underlies the Young Bay Mud. Such local variability can only be assessed at the project site level. These conditions can sometimes be identified through geotechnical coring, but definitive identification often requires geoarcheological testing, which provide for inspection and interpretation of cores by a geoarcheologist.

Overall, the modeled sensitivity for submerged Native American archeological resources in former offshore areas is highly variable, ranging from low to very high in the Northeast, South Beach, Mission Bay and Southern

[59] ENGEO, Incorporated, *Preliminary Geotechnical Report, Potrero Power Plant, San Francisco, California*, submitted to California Barrel Company LLC, 2017.

Waterfront areas, and low to high in the Fisherman's Wharf area. The Ferry Building area is modeled as having low sensitivity for submerged Native American resources. The depth below surface at which submerged Native American deposits might be encountered varies with location, depending on the prehistoric environmental setting and the depth of historic period landfill, but such deposits would consistently lie beneath the stratum of Young Bay Mud that was deposited as the bay formed, which in many waterfront areas, is overlain by historic period artificial fill.

HISTORIC ARCHEOLOGICAL RESOURCES

The Plan area includes the city's waterfront from India Basin at the southern end to the Aquatic Park at the northern end, and is divided into to five subareas: Fisherman's Wharf, Northeast Waterfront, South Beach, Mission Bay, and Southern Waterfront. With the exception of Potrero Point, the entire Plan area was within the waters of the bay through the mid-1850s and therefore there is the potential for historic resources, including shipwrecks, wharfs, and storeships, to be present under or at the base of later historic-period landfill. There are seven known shipwrecks and three documented storeships within the Plan area. Recorded shipbreaking sites (300 Spear, 201 Folsom-Hare's yard) have been discovered on the Yerba Buena Cove shoreline southwest of the Plan area, and there is potential for deposits associated with shipbreaking to be present within the Plan area as well. Other mid- to late-19th-century maritime related features that could be present within the Plan area include shipbuilding facilities near Steamboat Point and, later in time, at Potrero Point.

From the 1850s to the 1870s, there were a series of wharfs and piers that extended into the Plan area (see below for detailed list). Most of these structures were burned, demolished, or buried as the city filled in the bay to create what is today the modern shoreline of the city. Remnants of the city's waterfront seawalls, which include sections built in the late 1860s, and the current seawall, constructed between 1880 and 1924, also could be present within the Plan area. Given the large amount of fill deposited and the many sequences of fill events, there is potential for the presence of ships sunk as part of water lot filling, landfills and dumps, localized dumping off of piers as well as fill infrastructure within the fill, railroad remnants (ballast, grade, ties, fasteners, plates), and retaining walls.

Other property types that could be present within the Plan area include Chinese/Chinese American habitation and occupational areas along waterfront, although the planning department does not have record of any known Chinese-associated places within the Plan area. There also are no known burial places or isolated historic-era human remains within the Plan area; however, the Marine Hospital (1854–1868) was adjacent to the Plan area and may have had a burial ground in close proximity.

Finally, railroads dramatically altered the eastern shoreline of the city between the 1860s and the 20th century. A review of the historic lines within the city indicates that remnants of the Southern Pacific, Santa Fe, Western Pacific, California Belt, and Oceanshore line may be present within the Plan area. Although not specially recorded as an entire system, sections of the California Belt track are designated as contributing features to the multiple historic districts along the waterfront including the Central Embarcadero Piers Historic District, the South End Historic District, the Embarcadero Historic District, the Northeast Waterfront Historic District, and Pier 1. In addition, 19th and early-20th century transportation infrastructure, such as omnibuses, could be encountered within the Plan area.

Most specifically, historic-era property types that could be encountered in the Plan area are listed below according to subarea:

- **Fisherman's Wharf**
  - Shipwrecks: Tonquin, Carlota, Samoset
  - Wharfs: pre-1880 to 20th century wharfs including Meiggs Wharf, wharf east of Black Point
  - Seawall: 1880, 1881, 1893
  - Long structure depicted at the southeast corner of Fisherman's Wharf on The Embarcadero
  - Railroads: California Belt, Southern Pacific, Santa Fe
- **Northeast Waterfront**
  - Storeships: Le Baron, Tobacco Plant, Palmyra (adjacent), Japan (adjacent), Envoy (adjacent), Hone (adjacent), Fortura (adjacent), Bay Hotel (adjacent), Garnet (adjacent), Inez (adjacent), Elizabeth, Bethel (adjacent), Izzaide (adjacent)
  - Wharfs: pre-1880 to 20th c. wharfs including Lombard Dock, Greenwich Dock, India Dock, Cunningham Wharf, Minturm's Wharf, Vallejo Wharf, Broadway Wharf, Pacific Wharf, Clarke's Point, Pacific Wharf, Jackson Wharf, Washington Way, Clay Wharf, Commercial Way, Market Wharf, Mission Wharf, Howard Wharf, Folsom Way
  - Structures on Seawall Lots 314, 315, 316, 317, 318, 320, 321, 322
  - Early Streets: Davis Street, Front Street, Steuart Street, East Street
  - Railroads: California Belt, Southern Pacific, Santa Fe
- **South Beach Waterfront**
  - Shipwrecks: Lydia, Mary Ellen, Philadelphia Wharves: Point San Quantity Powder wharf
  - Seawall: 1908, 1909, 1910, 1911, 1914, 1915, 1924
  - Structures at Point San Quentin, Rincon Point, piers and structures along shoreline
  - First Street wharf, structures north of Rincon Point, piers at Steamboat Point
  - Structures at Seawall Lots 328, 329, 330, 331, 332
  - Railroads: Southern Pacific, California Belt
- **Mission Bay Waterfront**
  - Pier on Long Bridge (bridge across Mission Bay)
  - Structures on Block 3940
  - Railroads: Southern Pacific, Southern Pacific and Santa Fe
- **Southern Waterfront**
  - Roads and development at Potrero Point
  - Railroads and industrial development at Potrero Point
  - Bridge and pier east of the mouth of Islais Creek
  - Railroads: Southern Pacific, Western Pacific, Santa Fe

Five recorded historic period resources in the plan area have been documented at depths ranging between 3 and 5 feet below the modern surface to as much as 30 feet below the surface. Historic maritime features (sea walls, ships, piers, and wharves) most often are found at depths of 10 to 30 feet below the modern surface.[60]

APPROACH TO ANALYSIS

ARCHEOLOGICAL RESOURCES

Archeological resources can include historic resources; that is, resources that are considered significant because they meet one or more of the eligibility criteria of the California Register of Historical Resources (CEQA Guidelines section 15064.5), as well as unique archeological resources, as defined in CEQA section 21083.2(g). The significance of Native American and historic archeological sites most commonly is derived from the information potential contained within the site (under National Register Criterion D/California Register Criterion 4), rather than because the resource is an important example of a type (criteria C/3) or associated with an important person (criteria B/2) or event (criteria A/1), although some resources may also be significant under these other criteria.

Impacts on unique archeological resources or archeological resources that qualify as historic resources are assessed pursuant to CEQA section 21083.2, which states that the lead agency shall determine whether the project may have a significant effect on archeological resources. The lead agency must determine whether the project would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines section 15064.5(b)). A substantial adverse change is one that could result in alteration of a resource or, in some cases, of its physical setting, physical destruction or disturbance of all or part of an archeological deposit, or the removal of materials that results in a loss of information.

HUMAN REMAINS

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including Public Resources Code sections 5097.98 and 5097.99, and Health and Safety Code section 7050.5. These laws are discussed in the Regulatory Framework, above. Potentially significant impacts on human remains may include disturbance, destruction, or removal of interred human remains.

IMPACTS AND MITIGATION MEASURES

Impact CR-2: The Waterfront Plan could cause a substantial adverse change in the significance of an archeological resource. ***(Less than Significant with Mitigation)***

This section discusses archeological resources, which may either be potential historic resources according to CEQA Guidelines section 15064.5, or unique archeological resources as defined in CEQA section 21083.2(g). The mitigation measures below also address impacts to archeological resources that are also tribal cultural resources. Tribal cultural resources are defined and discussed in Section E.5 of this document.

Based on the results of previous archeological investigations, archival research, and an archeological sensitivity analysis documented in the preliminary archeological review (PAR) prepared for the Waterfront Plan area, discoveries of significant Native American archeological resources are possible in conjunction with soil-disturbing activities that could take place in the Waterfront Plan area as a result of adoption of the plan.

[60] Lentz, Kari. 2021. Environmental Planning Preliminary Archeological Review of Waterfront Plan. On file, Environmental Planning, Case file 2019-023037ENV, 6/29/2021.

The citywide Native American archeological sensitivity analysis, based on Far Western's sea-level rise shoreline modeling, identified areas that are within the Plan area, along the historic shoreline, and areas formerly or presently offshore that were inundated by the rising bay between about 2,000 and 8,000 years ago, that retain moderate to very high Native American archeological sensitivity for submerged and deeply buried Native American archeological resources. Except in small portions of the Northeast Waterfront, and the Southern Waterfront around Potrero Point and near the mouth of Islais Creek, where near surface and or buried Native American resources could be present at depths as shallow as 5 feet below surface, the potential to encounter Native American archeological deposits would be limited to deep excavations, pile construction or soil improvements that would extend below the base of the Young Bay Mud stratum, where submerged Native American deposits could be present.

In addition, portions of the Waterfront Plan area have a moderate to very high sensitivity for the presence of historic archeological resources, including buried and potentially submerged maritime resources such as abandoned ships and wharf features, as well as for non-maritime features developed during or after fill was placed in the bay during the historic period. Maritime resources generally could be encountered in deep excavations (in excess of 10 feet), pile construction or deep soil improvements to depths near the base of artificial fill or within the upper part of the Young Bay Mud stratum. However, historic features and deposits have been identified at depths as shallow as 3 to 5 feet in all of the plan areas except the Mission Bay waterfront. Areas with a very high historic archeological sensitivity include the portions of the Plan area from North Point southward to the Mission Creek channel; from 16th Street southward to about 24th Street; around the northwest end of Cargo Way; and around Heron's Head Park.

Ground-disturbing activities would occur during construction of subsequent projects that could occur with implementation of the Waterfront Plan. The potential to encounter resources of various types depends on the anticipated type and depth of soil disturbance, as noted above. For example, if the majority of anticipated ground disturbance would be confined to shallow excavations in landfill (e.g., for utility lines), there is a relatively low potential to encounter significant historic features or deposits and very low potential to encounter Native American deposits. However, excavations deeper than 5 feet below modern grade have the potential to encounter historic features or deposits in the artificial fill and, in a few areas, near surface or shallowly buried prehistoric Native American resources. In addition, subsequent projects that would entail the construction of pilings or other deep foundation systems, or of deep soil improvements, would have a moderate to very high potential to affect both Native American deposits and historic period archeological materials and features, depending on location. Although the depth of these future soil disturbances is unknown at this time, because the Plan area is almost entirely on landfill over bay mud, where deep foundations are generally necessary for any substantial construction, it can be anticipated that any new buildings and potentially major additions or retrofits to existing facilities could entail deep soil disturbance and therefore would have the potential for impacts to submerged and buried Native American and historic archeological resources. Such improvements and new developments, if they require pile driving or deep soil disturbance could occur in areas, and at depths, that are sensitive for both Native American and historic archeological resources, including submerged historic maritime features and Native American archeological resources. Therefore, excavations from subsequent projects that would be implemented under the Plan have the potential to physically damage or destroy known and as-yet undocumented archeological resources, resulting in ***significant*** impacts on archeological resources.

PRELIMINARY ARCHEOLOGICAL REVIEW PROCESS

For subsequent projects that entail soil-disturbing or soil-improving activities such as excavation, utility installation, grading, soil remediation, pile driving, or compaction/chemical grouting to a depth greater than 5 feet, the planning department would undertake a preliminary archeological review. This review, conducted by a planning department archeologist, is required, and is based primarily on the mapped archeological sensitivity of the project location,[61] review of known archeological resources, archival research, previous project site disturbance, site stratigraphy, and the extent and depth of proposed soil disturbance.

For subsequent projects that require a preliminary archeological review, the planning department archeologist will review project soil disturbance (e.g., extent, depth, and volume of proposed soil disturbances; whether piles or soil improvements are proposed); existing archeological site data; relevant historic archival maps and records; site soils and stratigraphy, based on available geotechnical coring data; historic and prehistoric environmental data; and Native American sensitivity modeling to arrive at a conclusion regarding whether the subsequent project has the potential to result in a significant impact to significant archeological resources. As part of the preliminary archeological review process, further investigations by a qualified archeological consultant, including preparation of a project-specific archeological sensitivity analysis or undertaking of project-specific archeological sensitivity assessment testing, may be required if determined necessary by planning department archeological staff. This additional sensitivity analysis would only occur when planning department archeological staff has determined a high potential for significant archeological resources to be present within the project site.

Based on the conclusions of the preliminary archeological review, the planning department would identify which, if any of the mitigation measures below would be required for each subsequent project:

- **M-CR-2a, Procedures for Accidental Discovery of Archeological Resources for Projects Involving Soil Disturbance**
- **M-CR-2b, Archeological Monitoring Program**
- **M-CR-2c, Archeological Testing Program**
- **M-CR-2d, Treatment of Submerged and Deeply Buried Resources**

While project-specific preliminary archeological review is the basis for determining the appropriate mitigation measures, the following general criteria apply to the identification of these measures. Implementation of Mitigation Measure M-CR-2a, Procedures for Accidental Discovery of Archeological Resources for Projects Involving Soil Disturbance, applies to project sites with moderate archeological sensitivity, anticipated archeological site types that would be identifiable by construction crews, and construction methods that allow for archeological site identification (such as shallow excavation). Implementation of Mitigation Measure M-CR-2b, Archeological Monitoring Program, applies to projects sites with moderate to high archeological sensitivity, anticipated archeological site types that require a trained archeologist for identification, and construction methods that allow for archeological site identification during project activities, such as excavation or other construction activities that allow for observation of and access to exposed soils. Mitigation Measure M-CR-2c, Archeological Testing Program, applies to project sites with moderate to high archeological sensitivity, anticipated archeological site types that require a trained archeologist for identification,

[61] Archeological sensitivity mapping delineates the relative archeological sensitivity of each area of the city based on geographic location, known resources, development history, and Native American archeological resource sensitivity modeling. The archeological sensitivity mapping is subject to updates based on new data, at the discretion of planning department archeological staff.

archeological site types that may require immediate or complex treatment or data recovery efforts, and/or where construction methods would include activities that would not expose soils for observations or where soils disturbed during construction activities cannot be easily observed, such as installation of deep foundations or deep trenching. All three mitigation measures include the same requirements after a significant archeological resource is identified.

Implementation of Mitigation Measure M-CR-2d, Treatment of Submerged and Deeply Buried Resources, would be implemented in tandem with one of the above measures (M-CR-2a, M-CR-2b, or M-CR-2c) and applies to subsequent projects that would include subgrade excavation to depths that would penetrate to native soil or below Young Bay Mud; or entail the use of piles, soil improvements or other deep foundations in landfill areas within former creeks, ponds, bay marshes or waters of the bay that may be sensitive for submerged or deeply buried historical or Native American archeological resources as determined in the preliminary archeological review prepared by the department; and in the event of the discovery of a submerged or deeply buried resource during archeological testing or soil-disturbing construction activities.

In addition, if preliminary archeological review identifies a high potential for the project to result in impacts to a Native American archeological resource, the department will notify Native American tribal representatives of that finding as required by Mitigation Measure M-TCR-1, Tribal Notification and Consultation. As discussed below under Tribal Cultural Resources, based on tribal cultural resources consultation, Native American archeological resources are presumed to be tribal cultural resources. Tribal cultural resources notification and consultation in tandem with the cultural resources mitigation measures below requires that Native American representatives be notified of projects that have the potential to impact Native American archeological resources and tribal cultural resources as identified through consultation and are offered the opportunity to consult on the treatment and interpretation of such resources in order to ensure that Native American cultural values are prioritized in the treatment and interpretation of archeological and tribal cultural resources. Per the results of tribal cultural resources consultation, the notification will indicate that in the event of the discovery of a potentially significant Native American archeological resource, as stipulated in the mitigation measures below, preservation in place will be the preferred mitigation option, and that if preservation is determined infeasible, that archeological data recovery and public interpretation, with tribal involvement, will be implemented, as specified below. The notification shall include a description of the subsequent project, location, anticipated depth and extent of soil disturbance necessary for construction, and information on changes to public access, removal or addition of native planting or habitat, and any proposed public interpretation as relevant; the conclusions of the preliminary archeological review regarding potential impacts to Native American archeological resources; anticipated next steps, including proposed archeological identification and/or treatment for archeological tribal cultural resources; an invitation to consult on the project; and a timeline for requesting consultation, which is within 30 days after receipt of a notification.

A subsequent tribal notification and invitation to participate will be distributed at the initiation of public interpretation planning. With implementation of the applicable mitigation measures noted above, identified through the preliminary archeological review process, impacts to archeological resources would be ***less than significant with mitigation***.

> **Mitigation Measure M-CR-2a: Procedures for Accidental Discovery of Archeological Resources.** The following mitigation measure shall be implemented for any projects for which the preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff identifies the potential for significant archeological impacts.

All plans and reports prepared by the qualified archeologist (hereinafter, "project archeologist"), as specified herein and in the subsequent measures, shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

ALERT Sheet. The project sponsor shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils-disturbing activities within the project site. Prior to any soils-disturbing activities being undertaken, each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) confirming that all field personnel involved in soil-disturbing activities have received copies of the Alert Sheet.

Procedures upon Discovery of a Potential Archeological Resource. The following measures shall be implemented in the event of an archeological discovery during project soil-disturbing activities:

- *Discovery Stop Work and ERO Notification.* Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project, the project sponsor shall immediately notify the ERO and shall immediately suspend any soils-disturbing activities in the vicinity of the discovery and protect the find in place until the ERO has determined what additional measures should be undertaken, as detailed below.
- *Project Archeologist.* If the ERO determines that the discovery may represent a significant archeological resource, the Port/project sponsor shall retain the services of a project archeologist; that is, one who meets the Secretary of the Interior's Professional Qualification Standards,[62] and who has demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American deposits and/or in the identification and treatment of 19th century archeological resources, including maritime resources as applicable, to examine and preliminary evaluate the significance and historic integrity of the resource.

  The project sponsor shall ensure that the project archeologist or designee is empowered, for the remainder of soil disturbing project activity, to halt soil disturbing activity in the vicinity of potential archeological finds, and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.
- *Resource Evaluation and Treatment Determination.* The project archeologist shall examine and appropriately document the discovered resource and make a recommendation to the ERO as to what further actions, if any, are warranted. Based on this information, the ERO may require the project sponsor to implement specific treatment measures to address impacts to the resource. Treatment measures might include preservation in situ of the archeological resource (the

[62] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

preferred mitigation; see below); an archeological monitoring program; an archeological testing program; archeological data recovery; and/or an archeological interpretation program, as detailed below. If an archeological interpretive, monitoring, and/or testing program are required, these shall be consistent with the Environmental Planning Division guidelines for such programs and shall be implemented immediately in accordance with the archeological monitoring and testing protocols set forth in Mitigation Measures M-CR-2b, Archeological Monitoring; M-CR-2c, Archeological Testing; and/or M-CR-2d, Submerged or Deeply Buried Resources, as detailed in the Waterfront Plan EIR MMRP. The ERO may also require that the project sponsor immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions. In addition, the ERO shall notify any tribal representatives who responded to the project tribal cultural resources notification and requested to be notified of the discovery of Native American archeological resources and to coordinate on the treatment of archeological and tribal cultural resources.

- *Archeological Site Records.* At the conclusion of assessment, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.
- *Submerged Paleosols.* Should a submerged paleosol be identified the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for environmental reconstruction, irrespective of whether cultural material is present.
- *Preservation in Place Consideration.* Should a significant archeological resource be discovered during construction or during archeological testing or monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s), if requested, to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If based on this consultation the ERO determines that preservation in place would be both feasible and effective, based on this consultation, then the project archeologist, in consultation with the tribal representative, if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological resources, the CRPP shall explicitly take into consideration the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as design of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port/project sponsor shall ensure that the approved plan is implemented during and after construction. If, based on this consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out, as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

- *Coordination with Descendant Communities.* On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.
- *Compensation.* Tribal representatives or other descendant community representatives for archeological resources or tribal cultural resources, who participate in the project, shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. The project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeological consultant, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, if requested, shall consult on the scope of the data recovery program. The project archeologist shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

If archeological data recovery is required, the archeological data recovery program required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction may be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less-than-significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a) and (c).

The ADRP shall include the following elements:

- Field Methods and Procedures: Descriptions of proposed field strategies, procedures, and operations.

- Cataloguing and Laboratory Analysis: Description of selected cataloguing system and artifact analysis procedures.
- Discard and Deaccession Policy: Description of and rationale for field and post-field discard and deaccession policies.
- Security Measures: Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- Final Report: Description of proposed report format and distribution of results.
- Public Interpretation: Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with project sponsor
- Curation: Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, the following measures shall be implemented to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both archeological consultants and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the archeological consultant for the subsequent project shall consult with the prior archeological consultant, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. If human remains or suspected human remains are encountered during construction, the contractor and project sponsor shall ensure that ground-disturbing work within 50 feet of the remains is halted immediately and shall arrange for the protection in place of the remains until appropriate treatment and disposition have been agreed upon and implemented in accordance with this section. The treatment of any human remains and funerary objects discovered during any soils disturbing activity shall comply with applicable state laws, including Health and Safety Code section 7050.5 and Public Resources Code section 5097.98. Upon determining that the remains are human, the project archeologist shall immediately notify the Medical Examiner of the City and County of San Francisco of the find. The archeologist shall also immediately

notify the ERO and the project sponsor of the find. In the event of the Medical Examiner's determination that the human remains are Native American in origin, the Medical Examiner will notify the California State Native American Heritage Commission (NAHC) within 24 hours. The NAHC will immediately appoint and notify a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of State law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative

elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. If significant resources are encountered, the project archeologist shall submit a confidential draft Archeological Resources Report (ARR) to the ERO that evaluates the California Register significance of any discovered archeological resource, describes the archeological and historic research methods employed in the archeological program(s) undertaken and the results and interpretation of analyses, and discusses curation arrangements.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. If archeological data recovery is undertaken, the project archeologist and the project sponsor shall ensure that any significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port or project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2b: Archeological Monitoring Program. If required based on the outcome of preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff, the project sponsor shall retain the services of a project archeologist (hereinafter 'project archeologist), to develop and implement an archeological monitoring program and to address any archeological discoveries, as detailed below, to avoid and mitigate any potential adverse effect from the proposed action on significant archeological resources found during construction.

Qualified Archeologist. A qualified archeologist (hereinafter, "project archeologist") is defined as one who meets the Secretary of the Interior's Professional Qualification Standards,[63] and who has

[63] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American deposits and/or in the identification and treatment of 19th century archeological resources, including maritime resources as applicable.

Construction Crew Archeological Awareness. Prior to any soils-disturbing activities being undertaken, the Port shall ensure that the project archeologist conducts a brief on-site archeological awareness training. Training shall include a description of the types of resources that might be encountered and how they might be recognized, and requirements and procedures for work stoppage, resource protection and notification in the event of a potential archeological discovery. The project archeologist also shall coordinate with the project sponsor to ensure that all field personnel involved in soil disturbing activities, including machine operators, field crew, pile drivers, supervisory personnel, etc., have received an "Alert" wallet card that summarizes stop work requirements and provides necessary contact information for the project archeologist, project sponsor and the ERO. The project archeologist shall repeat the training at intervals during construction, as determined necessary by the ERO, including when new construction personnel start work and prior to periods of soil disturbing work when the project archeologist will not be on site.

Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project in the absence of the project archeologist, the project sponsor shall immediately notify the project archeologist, and shall immediately suspend any soils-disturbing activities in the vicinity of the discovery until the project archeologist has inspected the find and, in consultation with the ERO as needed, has determined what additional measures should be undertaken.

Tribal Cultural Resources Sensitivity Training. In addition to and concurrently with the archeological awareness training, for sites at which the ERO has determined that there is the potential for the discovery of Native American archeological resources, and if requested by a tribe pursuant to the department's tribal cultural resources notification process, the Port shall ensure that a Native American representative is afforded the opportunity to provide a Native American cultural resources sensitivity training to all construction personnel.

General Specifications. The archeological consultant shall develop and undertake an archeological monitoring program as specified herein. In addition, the consultant shall be available to conduct an archeological testing and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure.

The project archeologist's work shall be conducted in accordance with this measure at the direction of the ERO. All plans and reports prepared by the project archeologist as specified herein shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

The project sponsor shall ensure that the project archeologist or designee is empowered to halt soil disturbing activity in the vicinity of a potential archeological find and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.

Archeological testing and/or data recovery programs required to address archeological discoveries, pursuant to this measure, could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks

only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a)(c).

Archeological Monitoring Program. Based on the results of information provided in the preliminary archeological review and additional historic research as needed, the project archeologist shall consult with the ERO reasonably prior to the commencement of any project-related soils disturbing activities to determine what soil-disturbing project activities shall be archeologically monitored, and at what intensity, based on the specifics of anticipated soil disturbance for project construction, past development history, and the assessed risk these activities pose to undiscovered archeological resources and their depositional context. The archeological monitoring program shall be set forth in an Archeological Monitoring Plan (AMP), as detailed below.

The project archeologist or delegee ("Archeological Monitor") shall be present on the project site according to a schedule agreed upon by the project archeologist and the ERO until the ERO has, in consultation with the project archeologist, determined that project construction activities could have no effects on significant archeological deposits. The archeological monitor(s) shall prepare a daily monitoring log documenting activities and locations monitored, soil disturbance depth, stratigraphy and findings.

The project sponsor shall authorize the archeological monitor to stop soil disturbing construction activity temporarily in the vicinity of a suspected find, to document the resource, collect samples as needed, and assess its significance. The project sponsor shall ensure that the find is protected in place in accordance with the archeologist's direction, and that it remains protected until the archeologist, after consultation with the ERO, notifies the sponsor that assessment and any subsequent mitigation are complete. The sponsor shall also ensure that the construction foreperson or other on-site delegee, is aware of the stop work and protection requirements.

In the event of a discovery of a potentially significant archeological resources during monitoring or construction, the project archeologist shall conduct preliminary testing of the discovery, including the collection of soil samples and artifactual/ ecofactual material, as needed to assess potential significance and integrity. Once this initial assessment has been made, the project archeologist shall consult with the ERO on the results of the assessment. If the resource is assessed as potentially significant, the Port/ project sponsor shall ensure that soil disturbance remains halted at the discovery location until appropriate treatment has been determined in consultation with the ERO and implemented, as detailed below.

Archeological Monitoring Plan. The archeological monitoring plan, minimally, shall include the following provisions:

- Project description: Description of all anticipated soil disturbing activities, with locations and depths of disturbance. These may include foundation and utility demolition, hazardous soils remediation, site grading, shoring excavations, piles or soil improvements, and foundation, elevator, car stacker, utility and landscaping excavations. Project plans and profiles shall be included as needed to illustrate the locations of anticipated soil disturbance.
- Site-specific environmental and cultural context: Pre-contact and historic environmental and cultural setting of the project site as pertinent to potential Native American use and historic period development; any available information pertaining to subsequent soil disturbance as pertains to

potential survival of archeological resources, strata in and depths at which they might be found. As appropriate based on the scale and scope of the project, the AMP should include maps (e.g., USCS 1869; Sanborn fire insurance maps) that depict the historic and environmental setting and changes in the project site, as a basis for predicting resource types that might be encountered and their potential locations. An overlay of the project site on the City's Native American sensitivity model mapping should be included, as should the locations of all known archeological sites within ¼ mile of the project site.

- Analysis of anticipated resources or resource types that might be encountered and at what locations and depths, based on known resources in the vicinity, the site's predevelopment setting and development history, and the anticipated depth and extent of project soil disturbances.
- Proposed scope of archeological monitoring, including soil-disturbing activities/ disturbance depths to be monitored.
- Synopsis of discovery procedures, ERO and Native American consultation requirements upon making a discovery; burial treatment procedures; and reporting and curation requirements, consistent with the other specifications of this measure.

Resource Evaluation and Treatment Determination. If an archeological deposit or feature is encountered during construction, the archeological monitor shall redirect soil disturbing demolition/ excavation/ piledriving/ construction crews and heavy equipment activity in the vicinity away from the find. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the project sponsor shall ensure that pile driving is halted until an appropriate evaluation of the resource has been made.

The project archeologist shall document the find, and make a reasonable effort to assess its identity, integrity, and significance of the encountered archeological deposit through, sampling or testing as needed. The project sponsor shall make provisions to ensure that the project archeologist can safely enter the excavation, if feasible.

If upon examination the project archeologist determines the find appears to be a potentially significant archeological resource, the project archeologist shall present the findings of this assessment to the ERO. The project sponsor shall ensure that the find is protected until the ERO has been consulted and has determined appropriate subsequent treatment in consultation with the project archeologist and the treatment has been implemented, as detailed below.

All Native American archeological deposits, irrespective of level of disturbance, shall be assumed to be significant until and unless determined otherwise in consultation with the ERO. If a Native American archeological deposit is encountered, the project archeologist shall obtain the services of a Native American tribal representative to participate in any future archeological monitoring, assessment or data recovery activities that may affect that resource. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources. Further the project archeologist shall offer a Native American representative the opportunity to monitor any subsequent soil disturbing activity that could affect the find.

Submerged Paleosols. Should a submerged paleosol be identified, the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable

special analyses pertinent to identification of possible cultural soils and for environmental reconstruction, irrespective of whether cultural material is present.

Archeological Site Records. At the conclusion of assessment of any discovered resources, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.

Preservation in Place Consideration. Should a significant archeological resource be discovered during construction or during archeological monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s) if requested to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If based on this consultation the ERO determines that preservation in place would be both feasible and effective, then the project archeologist, in consultation with the tribal representative if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological resources, the CRPP shall explicitly take into consideration the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as design of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port shall ensure that the approved plan is implemented during and after construction. If, based on this consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out, as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

Coordination with Descendant Communities. On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.

Compensation. Tribal representatives or other descendant community representatives for archeological resources or tribal cultural resources who participate in the project shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the

Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. The project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeologist, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, if requested, shall consult on the scope of the data recovery program. The project archeologist shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain; that is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

The ADRP shall include the following elements:

- Field Methods and Procedures. Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis. Description of selected cataloguing system and proposed types of analyses to be conducted based on anticipated material types.
- Discard and deaccession policy. Description of and rationale for field and post-field discard and deaccession policies.
- Security measures. Recommended security measures to protect the archeological resource from vandalism, looting, and accidental damage.
- Final report. Description of report format and distribution.
- Public interpretation. Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with the project sponsor.
- Curation. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in

progress, or is planned, the following measures shall be implemented, to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both project archeologists and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the project archeologist for the subsequent project shall consult with the prior project archeologist, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; avoid redundant work and maximize the benefits of additional data recovery; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. The treatment of human remains and funerary objects discovered during any soil-disturbing activity shall comply with applicable State and federal laws. This shall include immediate notification of the Medical Examiner of the City and County of San Francisco. The ERO also shall be notified immediately upon the discovery of human remains. In the event of the Medical Examiner's determination that the human remains are Native American remains, the Medical Examiner shall notify the California State Native American Heritage Commission, which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)).

The project sponsor and ERO shall make all reasonable efforts to develop a Burial Agreement ("Agreement") with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and associated or unassociated funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). The Agreement shall take into consideration the appropriate excavation, removal, recordation, scientific analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. If the MLD agrees to scientific analyses of the remains and/or associated or unassociated funerary objects, the archeological consultant shall retain possession of the remains and associated or unassociated funerary objects until completion of any such analyses, after which the remains and associated or unassociated funerary objects shall be reinterred or curated as specified in the Agreement.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation,

and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of State law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO. If significant resources were found, the report shall also describe any archeological testing and data recovery efforts and results, and evaluation of the California Register and tribal significance of any discovered archeological resource. It shall also describe the research design, archeological and historic research methods employed, analytical results and interpretations, and if applicable, curation

arrangements. Daily monitoring logs and formal site recordation forms (CA DPR 523 series) shall be attached to the ARR as an appendix.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one (1) bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port or project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2c: Archeological Testing Program. If required based on the outcome of preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff, the Port/ project sponsor shall retain the services of a qualified archeologist (hereinafter "project archeologist"), to develop and implement an archeological testing program and to address any archeological discoveries, as detailed below, to avoid and mitigate any potential substantial adverse effects from the proposed action on significant archeological resources found during construction.

Project Archeologist. A project archeologist is defined as one who meets the Secretary of the Interior's Professional Qualification Standards,[64] and who has demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American deposits and/or in the identification and treatment of 19th century archeological resources, including maritime resources as applicable.

Construction Crew Archeological Awareness. Prior to any soils-disturbing activities being undertaken, the Port shall ensure that the project archeologist conducts a brief on-site archeological awareness training. Training shall include a description of the types of resources that might be encountered and how they might be recognized, and requirements and procedures for work stoppage, resource protection and notification in the event of a potential archeological discovery. The project archeologist also shall coordinate with the project sponsor to ensure that all field personnel involved in soil disturbing activities, including machine operators, field crew, pile drivers, supervisory

[64] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

personnel, etc., have received an "Alert" wallet card that summarizes stop work requirements and provides necessary contact information for the project archeologist, project sponsor and the ERO. The project archeologist shall repeat the training at intervals during construction, as determined necessary by the ERO, including when new construction personnel start work and prior to periods of soil disturbing work when the project archeologist will not be on site.

Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project in the absence of the project archeologist, the project sponsor shall immediately suspend any soils-disturbing activities in the vicinity of the discovery and notify the project archeologist, and shall ensure that the find is protected until a project archeologist has inspected it and, in consultation with the ERO as needed, has determined what additional measures should be undertaken. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources.

Tribal Cultural Resources Sensitivity Training. In addition to and concurrently with the archeological awareness training, for sites at which the ERO has determined that there is the potential for the discovery of Native American archeological resources, and if requested by a tribe pursuant to the department's tribal cultural resources notification process, the Port shall ensure that a Native American representative is afforded the opportunity to provide a Native American cultural resources sensitivity training to all construction personnel.

General Specifications. The archeological consultant shall develop and undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure.

The project archeologist's work shall be conducted in accordance with this measure at the direction of the ERO. All plans and reports prepared by the project archeologist as specified herein shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

The project sponsor shall ensure that the project archeologist or designee is empowered to halt soil disturbing activity in the vicinity of a potential archeological find and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.

Archeological testing and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a)(c).

Archeological Testing Program. The archeological consultant shall develop and undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure. The purpose of the archeological testing program will be to determine to the extent possible

the presence or absence of archeological resources in areas of project soil disturbance and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historic resource under CEQA.

Archeological Testing Plan (ATP). The project archeologist shall consult with the ERO reasonably prior to the commencement of any project-related soils disturbing activities to determine the appropriate scope of archeological testing. The archeological testing program shall be conducted in accordance with an approved ATP, prepared by the project archeologist consistent with the approved scope of work. The ATP shall be submitted first and directly to the ERO for review and comment and shall be considered a draft subject to revision until final approval by the ERO. Project-related soils disturbing activities shall not commence until the testing plan has been approved and any testing scope to occur in advance of construction has been completed. The project archeologist shall implement the testing as specified in the approved ATP prior to and/or during construction.

The ATP, minimally, shall include the following:

- Project description: Description of all anticipated soil disturbing activities, with locations and depths of disturbance. These may include foundation and utility demolition, hazardous soils remediation, site grading, shoring excavations, piles or soil improvements, and foundation, elevator, car stacker, utility and landscaping excavations. Project plans and profiles shall be included as needed to illustrate the locations of anticipated soil disturbance.
- Site-specific environmental and cultural context: Pre-contact and historic environmental and cultural setting of the project site as pertinent to potential Native American use and historic period development, any available information pertaining to subsequent soil disturbance as pertains to potential survival of archeological resources, and strata in and depths at which they might be found, such as stratigraphic and water table data from prior geotechnical testing. As appropriate based on the scale and scope of the project, the ATP should include maps (e.g., USCS 1869; Sanborn fire insurance maps) that depict the historic and environmental setting and changes in the project site as a basis for predicting resource types that might be encountered and their potential locations. An overlay of the project site on the City's Native American sensitivity model mapping should be included, as should the locations of all known archeological sites within 0.25 mile of the project site.
- Brief research design: scientific/historic research questions applicable to the expected resource(s), what data classes potential resources may be expected to possess, and how the expected data classes would address the applicable research questions.
- Analysis of anticipated resources or resource types that might be encountered and at what locations and depths, based on known resources in the vicinity, the site's predevelopment setting and development history, and the anticipated depth and extent of project soil disturbances.
- Proposed scope of archeological testing and rationale: testing methods to be used (e.g., coring, mechanical trenching, manual excavation, or combination of methods); locations and depths of testing in relation to anticipated project soil disturbance; strata to be investigated; any uncertainties on stratigraphy that would affect locations or depths of tests and might require archeological monitoring of construction excavations subsequent to testing.

- Resource documentation and significance assessment procedures. ERO and Native American consultation requirements upon making a discovery; pre-data recovery assessment process, consistent with the specifications of this measure
- Standard text on burial treatment procedures; and
- Reporting and curation requirements.

Archeological Testing Results Memo. Irrespective of whether archeological resources are discovered, the archeological consultant shall submit a written summary of the findings to the ERO at the completion of the archeological testing program. The findings report/memo shall describe each resource, provide an initial assessment of the integrity and significance of encountered archeological deposits encountered during testing, and provide recommendations for subsequent treatment of any resources encountered.

Resource Evaluation and Treatment Determination. If an archeological deposit or feature is encountered during testing or subsequent construction soil disturbance, the project archeologist shall redirect soil disturbing demolition/ excavation/ piledriving/ construction crews and heavy equipment activity in the vicinity away from the find. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the project sponsor shall ensure that pile driving is halted until an appropriate evaluation of the resource has been made.

The project archeologist shall document the find, and make a reasonable effort to assess its identity, integrity, and significance of the encountered archeological deposit through, sampling or testing as needed. The project sponsor shall make provisions to ensure that the project archeologist can safely enter the excavation, if feasible.

If upon examination the project archeologist determines the find appears to be a potentially significant archeological resource, the project archeologist shall present the findings of this assessment to the ERO. The project sponsor shall ensure that the find is protected until the ERO has been consulted and has determined appropriate subsequent treatment in consultation with the project archeologist and the treatment has been implemented, as detailed below.

All Native American archeological deposits, irrespective of level of disturbance, shall be assumed to be significant until and unless determined otherwise in consultation with the ERO. If a Native American archeological deposit is encountered, the project archeologist shall obtain the services of a Native American tribal representative to participate in any future archeological monitoring, assessment or data recovery activities that may affect that resource. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources. Further the project archeologist shall offer a Native American representative the opportunity to monitor any subsequent soil disturbing activity that could affect the find.

Submerged Paleosols. Should a submerged paleosol be identified, the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for environmental reconstruction, irrespective of whether cultural material is present.

Archeological Site Records. At the conclusion of assessment of any discovered resources, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.

Preservation in Place Consideration. Should a significant archeological resource be discovered during construction or during archeological testing or monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s) if requested, to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If, based on this consultation, the ERO determines that preservation in place is determined to be both feasible and effective, then the project archeologist, in consultation with the tribal representative if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological resources, the CRPP shall explicitly address the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as redesign of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port/project sponsor shall ensure that the approved plan is implemented during and after construction. If, based on consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

Coordination with Descendant Communities. On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.

Compensation. Tribal representatives or other descendant community representatives for archeological or tribal cultural resources who participate in the project shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. the project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeologist, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, shall coordinate on the scope of the data recovery program, if requested. The archeological consultant shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain; that is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

The ADRP shall include the following elements:

- Field Methods and Procedures: Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis: Description of selected cataloguing system and proposed types of analyses to be conducted based on anticipated material types.
- Discard and deaccession policy: Description of and rationale for field and post-field discard and deaccession policies.
- Security measures: Recommended security measures to protect the archeological resource from vandalism, looting, and accidental damage.
- Final report: Description of proposed report format and distribution of results.
- Public interpretation: Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with the project sponsor.
- Curation: Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in

progress, or is planned, the following measures shall be implemented to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both project archeologists and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the project archeologist for the subsequent project shall consult with the prior project archeologist, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; avoid redundant work and maximize the benefits of additional data recovery; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. The treatment of human remains and funerary objects discovered during any soil-disturbing activity shall comply with applicable State and federal laws. This shall include immediate notification of the Medical Examiner of the City and County of San Francisco. The ERO also shall be notified immediately upon the discovery of human remains. In the event of the Medical Examiner's determination that the human remains are Native American remains, the Medical Examiner shall notify the California State Native American Heritage Commission, which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)).

The project sponsor and ERO shall make all reasonable efforts to develop a Burial Agreement ("Agreement") with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and associated or unassociated funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). The Agreement shall take into consideration the appropriate excavation, removal, recordation, scientific analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. If the MLD agrees to scientific analyses of the remains and/or associated or unassociated funerary objects, the archeological consultant shall retain possession of the remains and associated or unassociated funerary objects until completion of any such analyses, after which the remains and associated or unassociated funerary objects shall be reinterred or curated as specified in the Agreement.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation,

and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of state law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the testing program to the ERO. If significant resources were found, the report shall also describe any archeological testing and data recovery efforts and results and provide evaluation of the California Register and tribal significance of any discovered archeological resource. It shall also describe the research design, archeological and historic research methods employed, analytical results and interpretations, and if

applicable, curation arrangements. Formal site recordation forms (CA DPR 523 series) shall be attached to the ARR as an appendix.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port of project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2d: Treatment of Submerged and Deeply Buried Resources. This measure applies to projects that would include multiple subgrade stories or entail the use of piles, soil improvements or other deep foundations in landfill areas within former creeks, bay marshes or waters of the bay that may be sensitive for submerged or buried historic or Native American resources as determined in the preliminary archeological review prepared by the department; and/or in the event of the discovery of a submerged or deeply buried resource during archeological testing or soil-disturbing construction activities. This measure shall be applied in conjunction with Waterfront Plan Mitigation Measures M-CR-2a, Accidental Discovery, and/or M-CR-2b, Archeological Monitoring Program, and/or M-CR-2c, Archeological Testing Program, and all relevant provisions of those measures shall be implemented in addition to the provisions of this measure, as detailed below.

The following measures additional shall be undertaken upon discovery of a potentially significant deeply buried or submerged resource to minimize significant effects from deep project excavations, soil improvements, pile construction, or construction of other deep foundation systems, in cases where the ERO has determined through consultation with the sponsor, and with tribal representatives as applicable, that preservation in place—the preferred mitigation—is not a feasible or effective option. Note that limiting impacts to a buried or submerged deposit to pile driving or soil improvements shall not be construed as representing preservation in place.

Treatment Determination. If the resource cannot feasibly or adequately be preserved in place, in situ documentation and/or archeological data recovery shall be conducted, consistent with the provisions of Mitigation Measures M-CR-2a, Accidental Discovery; M-CR-2b, Archeological Monitoring Program; and M-CR-2c, Archeological Testing Program, as detailed in the Waterfront Plan EIR MMRP. However, by definition, such resources sometimes are located deeper than the maximum anticipated depth of project mass excavations, such that the resource would not be exposed for investigation, and/or under

water or may otherwise pose substantial access, safety or other logistical constraints for data recovery; or the cost of providing archeological access to the resource may demonstrably be prohibitive.

In such cases, where physical documentation and data recovery will be limited by the constraints identified above, the ERO, project sponsor, project archeologist, and tribal representative if requested, shall consult to explore alternative documentation and treatment options to be implemented in concert with any feasible archeological data recovery. The appropriate treatment elements, which would be expected to vary with the type of resource and the circumstances of discovery, shall be identified by the ERO based on the results of consultation from among the measures listed below. Additional treatment options may be developed and agreed upon through consultation if it can be demonstrated that they would be equally or more effective in recovering or amplifying the value of the data recovered from physical investigation of the affected resources by addressing applicable archeological research questions and in disseminating those data and meaningfully interpreting the resource to the public.

Potential treatment measure options listed below are applicable to both Native American deposits and features, and historic maritime resources. Each treatment measure or a combination of these treatment measures, in concert with any feasible standard data recovery methods applied as described above, would be effective in mitigating significant impacts to submerged and buried resources. However, some measures are more applicable to one type of resource than the other; to a specific construction method; to the specific circumstances of discovery; and to the stratigraphic position of the resource. The ERO, in consultation with the project archeologist and project sponsor, shall identify which of these measures that, individually or in combination, will be applicable and effective in recovering sufficient data, enhancing the research value of the data recovery, meaningfully interpreting the resource to the public, or otherwise effectively mitigating the loss of data or associations that will result from project construction. Multiple treatment measures shall be adopted in combination, as needed to adequately mitigate data loss and, as applicable, impacts to tribal cultural values, as determined in consultation with the ERO and, as applicable, tribal representatives.

Additional treatment options may be considered and shall be adopted, subject to ERO approval, if it can be demonstrated that they would provide data relevant to the understanding and interpretation of the resource on the project site or to the affected class of resources (e.g., rare submerged and deeply buried Native American resources of Early or Middle Holocene age); or that would otherwise enhance the scientific or historic research value of any data recovered directly from the resource; and/or would enhance public interpretation of the resource, as detailed below.

Treatment Program Memo. The project archeologist shall document the results of the treatment program consultation with respect to the agreed upon scope of treatment in a treatment program memo, for ERO review and approval. Upon approval by the ERO, the project sponsor shall ensure that treatment program is implemented prior to and during subsequent construction, as applicable. Reporting, interpretive, curation and review requirements are the same as delineated under the other cultural resources mitigation measures that are applicable to the project, as noted above. The project sponsor shall be responsible for ensuring the implementation of all applicable mitigation measures, as identified in the treatment program memo.

Potential Treatment Measures.

- *Remote Archeological Documentation.* Where a historic feature cannot be recovered or adequately documented in place by the archeologist due to size, bulk or inaccessibility, the archeologist shall conduct all feasible remote documentation methods, such as 3-D photography using a remote access device, remote sensing (e.g., ground-penetrating radar with a low-range [150 or 200 MHz] antenna), or other appropriate technologies and methods, to accurately document the resource and its context. As noted, the project sponsor and contractor shall support remote archeological documentation as needed, such as by assisting with equipment access (e.g., drone, lights and camera or laser scanner mounted on backhoe); providing personnel qualified to enter the excavation to assist with documentation; and accommodating training of construction personnel by the project archeologist so that they can assist in measuring or photographing the resource from inside the excavation in cases when the archeologist cannot be allowed to enter.
- *Modification of Contractor's Excavation Methods.* As needed to prevent damage to the resource before it has been documented; to assist in exposure and facilitate observation and documentation; and potentially to assist in data recovery; at the request of the ERO the project sponsor shall consult with the project archeologist and the ERO to identify modifications to the contractor's excavation and shoring methods. Examples include improved dewatering during excavation; use of a smaller excavator bucket or toothless bucket; discontinuing immediate offhaul of spoils and providing a location where spoils can be spread out and examined by the archeologist prior to being offhauled; and phasing or benching of deep excavations to facilitate observation and/or deeper archeological trenching.
- *Data Recovery through Open Excavation.* If the project will include mass excavation to the depth of the buried/submerged deposit, archeological data recovery shall include manual (preferred) or controlled mechanical sampling of the deposit. If project construction would not include mass excavation to the depth of the deposit but would impact the deposit through deep foundation systems or soil improvements, the ERO and the project sponsor shall consult to consider whether there are feasible means of providing direct archeological access to the deposit (for example, excavation of portion of the site that overlies the deposit to the subject depth so that a sample can be recovered). The feasibility consideration shall include an estimate of the project cost of excavating to the necessary depth and of providing shoring and dewatering sufficient to allow archeological access to the deposit for manual or mechanical recovery.
- *Mechanical Recovery.* If site circumstances limit access to the find in situ, the ERO, archeological consultant and project sponsor shall consider the feasibility of mechanically removing the feature or portion of a feature intact for off-site documentation and analysis, preservation and interpretive use. The consultation above shall include consideration as to whether such recovery is logistically feasible and can be accomplished without major data loss. The specific means and methods and the type and size of the sample shall be identified, and the recovery shall be implemented if determined feasible by the ERO. The sponsor shall assist with mechanical recovery and transport and curation of recovered materials and shall provide for an appropriate and secure off-site location for archeological documentation and storage as needed.
- *Salvage of Historic Materials.* Samples or sections of historic features that cannot be preserved in place (such a structural members of piers or wharves, sections of wooden sea wall, rail alignments, or historic utility or paving features of particular data value or interpretive interest) shall be tested for contamination and, if not contaminated, shall be salvaged for interpretive use or other reuse.

These might include uses such as display of a reconstructed resource; use of timbers or planks for furniture, such as landscape boxes, railings, benches or platforms, and signage structures, and installation of such features in publicly accessible open spaces; or other uses of public interest. Historic wood and other salvageable historic structural material not used for interpretation shall be recovered for reuse, consistent with the San Francisco Ordinance No.27-06, which requires recycling or reuse of all construction and demolition debris material removed from a project. If the project has the potential to encounter such features, the project sponsor shall plan in advance for reuse of salvaged historic materials to the greatest extent feasible, including identification of a location for interim storage and identification of potential users and reuses.

- *Data Recovery Using Geoarcheological Cores.* If, subsequent to identification and boundary definition of a buried/ submerged resource, it is deemed infeasible to expose the resource for archeological data recovery, geoarcheological coring of the identified deposit shall be conducted at grid intervals of no greater than 5 meters/15 feet. The maximum feasible core diameter shall be used for data recovery coring. However, while geoarcheological coring can provide basic data about a resource (e.g., food sources exploited, date), due to the of the small size of the sample recoverable through geoarcheological coring the recovered sample, even from numerous cores, this method generally cannot recover a sufficient quantity of data to adequate characterize the range of activities that took place at the site. For this reason, if the coring sample constitutes less than 5 percent of the estimated volume of material within the boundaries of the resource that will be directly impacted by project construction, the following additional measures shall be implemented in concert with geoarcheological coring to fully mitigate significant impacts to such a resource.
- *Scientific Analysis of Data from Comparable Archeological Sites/"Orphaned Collections."* The ERO and the project archeologist shall consult to identify a known archeological site or historic feature, or curated collections or samples recovered during prior investigation of similar sites or features are available for further analysis; and for which site-specific or comparative analyses would be expected to provide data relevant to the interpretation or context reconstruction for the affected site. Appropriate analyses, to be identified in consultation between the ERO, the consultant and (for Native American deposits) the Native American representative(s), may include reanalysis or comparative analysis of artifacts or archival records; faunal or paleobotanical analyses; dating; isotopes studies; or such other relevant studies as may be proposed by members of the project team based on the research design developed for the affected site and on data available from affected resource and comparative collections. The scope of analyses would be determined by the ERO based on consultation with the project archeologist, the project sponsor, and (for sites of Native American origin) Native American representatives.
- *Additional Off-Site Data Collection and/or Sample and Data Analysis for Historic and Paleoenvironmental Reconstruction.* The ERO and project archeologist shall identify existing geoarcheological data and geotechnical coring records on file with the city of San Francisco; and/or cores extracted and preserved during prior geotechnical or geoarcheological investigations that could contribute to reconstruction of the environmental setting in the vicinity of the identified resource, to enhance the historic and scientific value of recovered data by providing additional data about prehistoric environmental setting and stratigraphic sensitivity; and/or would provide information pertinent to the public interpretation of the significant resource. Objectives of such analyses, depending on the resource type could include: (1) placement of known and as-yet undiscovered Native American resources more securely in their environmental and chronological

contexts; (2) more-accurate prediction of locations that are sensitive for Middle Holocene and earlier resources; (3) increased understanding of changes in San Francisco's historic environmental setting (such as the distribution of inland marshes and ponds and forested areas), and of the chronology of both historic period and prehistoric environmental change and human use. Relevant data may also be obtained through geoarcheological coring at accessible sites identified by the ERO through consultation with San Francisco public agencies and private project sponsors.

Impact CR-3: The Waterfront Plan could disturb human remains, including those interred outside of formal cemeteries. ***(Less than Significant with Mitigation)***

As described above, there are no known archeological resources that contain human remains within the Waterfront Plan area. However, proposed construction activity associated with subsequent projects that could occur pursuant to implementation of the Waterfront Plan could extend below the known depth of fill and/or Young Bay Mud and into underlying native soil deposits that have elevated potential for containing buried Native American archeological resources and associated or isolated human remains. There also may be the potential for historic-period human remains to be present in artificial fill or in Young Bay Mud. Therefore, excavations related to the Waterfront Plan have the potential to damage or destroy human remains, which would be a significant impact.

Impacts on human remains are addressed under Impact CR-2 and would be mitigated to a less-than-significant level with implementation of the preliminary archeological review process described above, in conjunction with Mitigation Measures M-CR-2a, M-CR-2b, M-CR-2c, or M-CR-2d, as applicable based on the results of preliminary archeological review. The implementation of these mitigation measures would ensure that archeological resources that might contain human remains, and human remains in isolation, are identified prior to or during construction and are appropriately protected and treated. Therefore, impacts on human remains would be ***less than significant with mitigation***.

Impact C-CR-1: The Waterfront Plan, in combination with cumulative projects, could cause a substantial adverse change in the significance historical resources, as defined in CEQA Guidelines section 15064.5. ***(Potentially Significant)***

This topic is analyzed in Section 4.B, Historic Resources, of the Draft EIR.

Impact C-CR-2: The Waterfront Plan, in combination with cumulative projects, could result in significant cumulative impacts on archeological resources and human remains. ***(Less than Significant with Mitigation)***

The cumulative context for archeological resources and human remains includes urban development projects and transportation and streetscape improvements occurring within and surrounding the Waterfront Plan area, which together could lead to ground-disturbing activities that could result in impacts on archeological resources and human remains. The cumulative projects within and surrounding the Waterfront Plan area include development and infrastructure projects that propose new buildings as well as streetscape and public realm improvements. The cumulative analysis for archeological resources considers nearby projects that involve ground disturbance (see Chapter 4, Approach to Cumulative Impact Analysis, p. 4-8, for a list of cumulative projects considered in this analysis) all of which have identified the potential for archeological discoveries. These cumulative projects, in combination with the Waterfront Plan, have the potential to

demolish, destroy, relocate, or alter archeological resources and human remains. Taken together, the Waterfront Plan could have the potential to result in an overall cumulative impact on archeological resources and/or human remains, including some previously documented archeological resources, portions of which have been affected by other past projects.

As described under Impact CR-2, the Waterfront Plan would result in ground-disturbing activities in areas identified as having moderate to very high sensitivity for containing buried and submerged historic and Native American archeological resources or human remains, and therefore has the potential to result in significant impacts to these resources. The cumulative projects identified above that would include soil disturbance, in combination with the Waterfront Plan, have the potential to result in significant cumulative impacts to the same archeological resources through demolition, destruction, relocation, or alteration of archeological resources and human remains. The Waterfront Plan has the potential to contribute considerably to the overall cumulative impact on archeological resources and human remains; therefore, the cumulative impact would be significant.

Implementation of Mitigation Measures M-CR-2a, M-CR-2b, M-CR-2c, and/or M-CR-2d, as applicable, would reduce the contribution of subsequent Waterfront Plan projects to the significant cumulative impact to a less-than-significant level by preserving and interpreting the significant information represented by the resource, and through coordination of investigation and analytical efforts by different researchers and/or interpretation of investigative results of both investigations, as required by the Mitigation Measures M-CR-2a through M-CR-2d.

With implementation of these mitigation measures, the cumulative impact from development that could occur pursuant to the Waterfront Plan on archeological resources and human remains therefore would be ***less than significant with mitigation***.

5. Tribal Cultural Resources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
5. TRIBAL CULTURAL RESOURCES. Would the project:					
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, 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:	☐	☒	☐	☐	☐
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), or					
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.					

REGULATORY SETTING

This section describes the applicable state regulations that define and provide guidance for the identification of, analysis of impacts on, and mitigation of impacts to tribal cultural resources. Assembly Bill (AB) 52, adopted in September 2014, created a broad category of environmental resources, "tribal cultural resources," to be considered under CEQA. For all projects subject to CEQA for which a lead agency issues a notice of preparation, notice of negative declaration, or mitigated negative declaration on or after July 1, 2015, Public Resources Code section 21080.3.1 requires the lead agency to consult with the geographically affiliated California Native American tribes regarding tribal cultural resources that may be affected by the project.

Under Public Resources Code section 21074, a tribal cultural resource is a site, feature, place, cultural landscape, or sacred place or object that is of cultural value to a California Native American tribe. Tribal cultural resources generally include physical manifestations or characteristics—such as a specific object, place or geographic landmark—but generally are tribally valued for intangible qualities representative of or that honor the tribe's spiritual life, traditions, and history.

Public Resources Code section 21074 indicates that a tribal cultural resource may be found significant if it is on or meets the criteria of the California Register; or is listed on a local historical register. The California

Register criteria for identification of historical resources (which include significant tribal cultural resources), as defined in Public Resources Code section 5024.1(c), are the following:

1) The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2) The resource is associated with the lives of persons important in our past.
3) The resource embodies the distinctive characteristics of a type, period, region, or method of construction; represents the work of an important creative individual; or possesses high artistic values.
4) The resource has yielded, or may be likely to yield, information important in prehistory or history.

In addition, Public Resources Code section 21074(a)(2) states that the lead agency, at its discretion and based on substantial evidence, in determining that a resource meets the above California Register criteria, "shall consider the significance of the resource to the California Native American tribe." Public Resources Code section 21080.3.1(s) notes that, "The legislature finds and declares that California Native American tribes … may have expertise concerning their tribal cultural resources." Based on guidance from the California Office of Planning and Research (OPR), substantial evidence that may support the lead agency's determination may include tribal elder testimony, oral history, tribal government archival information, testimony of a qualified archeologist certified by the relevant tribe, testimony of an expert certified by the tribal government, official tribal government declarations or resolutions, formal statements from a certified Tribal Historic Preservation Officer (THPO), or historical notes, such as those found in the Harrington Papers[65] and other anthropological records. In summary, when a lead agency identifies a resource as a tribal cultural resource, that determination should be supported with substantial evidence, by applying the criteria in the California Register, and considering the significance of the resource to California Native American tribes.

Under Public Resources Code section 21010.3.1, lead agencies preparing an EIR are required to provide notice of the proposed project to California Native American tribes that are traditionally and culturally affiliated with the geographic area and that have requested to be informed of projects in that area. If a tribe requests consultation on a project within 30 days of notification, the lead agency must begin the consultation process within 30 days. Consultation with the tribe may include discussion of the type of environmental review necessary, identification of significant tribal cultural resources, and the significance of the project's impacts on identified tribal cultural resources. As part of the consultation process, the parties may propose alternatives and/or mitigation measures to reduce significant impacts to tribal cultural resources. Under Public Resource Code section 21080.3.2(b), the consultation process shall be deemed concluded when either (a) the parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource, or (b) a party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. If a tribe does not identify mitigation measures, a lead agency may still consider mitigation measures if the agency determines that a project will cause a substantial adverse change to a tribal cultural resource. Public Resource Code section 21084.3(b) provides examples of such mitigation measures to be considered by lead agencies to avoid or reduce significant adverse impacts to tribal cultural resources, which include preservation in place and permanent conservation easements.

[65] https://opr.ca.gov/ceqa/tribal/
[65] Harrington, J.P., *John Peabody Harrington papers: Costanoan (part 3), 1921–1939*. Smithsonian Museum of Natural History. Washington, DC.; microfilm images available online at https://learninglab.si.edu/resources/view/216584#more-info.

ETHNOGRAPHY AND ETHNOHISTORY OF THE PLAN AREA

This text was prepared in consultation with Ohlone Native American representatives.

At the time of the arrival of Europeans in central California in the 18th century, Ohlone Native Americans occupied an extensive territory that encompassed the San Francisco Peninsula, extended southward to the Big Sur and San Juan Bautista; and, inland, included the areas along both sides of the Carquinez Straits and extended eastward, beyond the East Bay hills to Walnut Creek and Livermore.[66] The Ohlone were speakers of the Penutian language (also referred to as Costanoan or Ohlone), which was comprised of six languages or dialect clusters: Karkin, Mutsun, Awaswas, Rumsen, Chalon, and San Francisco Bay Costanoan, which is comprised of three dialects—Ramaytush, Tamien, and Chochenyo[67] —each the primary dialect of Ohlone peoples in different geographic areas of the bay region.[68] Anthropologists hypothesize, based on inter-familial relationships reconstructed from mission records, that the Ohlone within each of these geographic areas were loosely politically organized. Whether such distinctions were culturally meaningful to the Ohlone people who spoke those dialects, and the exact geographic "boundaries" between linguistic groups are uncertain. While, for purposes of this ethnography, the population of each of these linguistic sub-areas is described as a "tribe," Milliken[69] cautions, "[s]uch a linguistic group approach can create a misleading and overly simplistic view of the complex mosaic of cultural variation in the aboriginal San Francisco Bay Area."

In the assessment of linguist Richard Levy,[70] the greater San Francisco Peninsula, including the area now occupied by the City and County of San Francisco and most of San Mateo County, was home to the *Ramaytush* Ohlone tribe. The total population of *Ramaytush* Ohlone speakers in the 1700s has been variously estimated at approximately 1,400,[71] 1,500,[72] and 2,000.[73] The boundaries of today's San Francisco generally correspond with the territory of the Yelamu, an independent tribe or tribal community of the Ramaytush Ohlone peoples,[74] which has been estimated to have included about 140 individuals at the time of the Spanish arrival in San Francisco in 1776.[75] Mission records suggest that the Yelamu, like other Ohlone tribes, were comprised of a number of smaller bands, each made up of several 10- to 15-person households that were associated with a village or a cluster of villages within the tribe's territory.

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[66] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, pp. 485–486.
[67] 2011. Golla, Victor. California Indian Languages. University of California Press. Berkeley.

[68] A Native American representative notes that it is likely that these dialects and the "boundaries" among them undoubtedly changed over time.
[69] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 13.
[70] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, p. 485; Levy, R., *Costanoan Internal Relationships*, Manuscript prepared for the Archaeological Research Facility, Department of Anthropology, University of California at Berkeley by Richard Levy, Department of Anthropology, University of Kentucky, 1976, Figure 1, p. 57.
[71] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978.
[72] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, Table 4, p. 64
[73] Bocek, B., *Subsistence, Settlement and Tribelet Territories on the Eastern San Francisco Peninsula*, Proceedings of the 24th Proceedings of the Annual Meeting of the Society for California Archaeology, 5: 269–297, 1992, https://scahome.org/publications/proceedings/Proceedings.05Bocek.pdf.
[74] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, Map 4, p. 228.
[75] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, Table 4, p. 64

Based on locational data and familial relationships among persons listed in Mission Dolores records, Milliken[76] suggests that there were three Yelamu bands in San Francisco, each associated with a certain village or villages:

> *Sitlintac and Chutchui, only a mile or two apart in the valley of Mission Creek, seem to have been Yelamu sites used at different times of year by one band of families. Another Yelamu band seems to have used the village sites of Amuctac and Tubsinte in the Visitacion Valley area in the same way. Petlenuc, perhaps near the site of the Spanish Presidio compound, seems to have been [the village of] a third small band.*

Other scholars argue, based on the close proximity to each other of various Yelamu villages along the bay shore, that the use of particular villages was not seasonal, and that movement by family and village members between their home village and other villages within their tribal territory appears to have been quite fluid.[77]

Archeological evidence indicates that San Francisco has been occupied for at least 7,600 years and that the locations and numbers of Native American settlements changed over thousands of years of human habitation. At least 40 sites of Native American origin have been identified in San Francisco through archeological testing and/or archival information, and about 25 of these have been investigated to some extent by archeologists. There are clusters of archeologically recorded Native American occupation sites in the present-day Inner Mission District, around the Presidio, and in Visitation Valley. Some of these may correlate with the ethnographic period villages referenced above. Three archeological sites in the general vicinity of Mission San Francisco de Asís (Mission Dolores) have yielded artifacts or features (e.g., 18th century glass trade beads) that evidence contact-period occupation; whether any of these represents ethnographically identified village sites, such as Chutchui or Sitlintac, or possibly a neophyte (mission convert) settlement, is uncertain. There are also many recorded Native American archeological sites in the South of Market neighborhood, near the historic period shoreline of Mission Bay and its marshes. Sites near the historic bay shoreline that have been investigated indicate widespread Native American occupation, particularly near the coastal and bay shore portions of Yelamu territory, well before the arrival of the Spanish in San Francisco.

Based on Milliken's interpretation of Mission Dolores records, Yelamu bands often were interlinked by marriage within the triblet. The Yelamu also intermarried with people who lived in the villages of other tribes, generally one or two tribal territories distant from their own, including with tribes who resided north and east of San Francisco[78] and with tribes immediately to the south along the San Francisco Peninsula.[79]

Within the tribe, bands or family households assisted with planning for resource collection and management among bands, and possibly more broadly. Most of the year, households in a band might share a single, large village site, but at other times, households might disperse to satellite villages to optimize resource-extraction during seasonal changes or for other reasons.[80] There appears to have been substantial fluidity, both in the

[76] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 260.
[77] Cordero, Jonathan, Jonathan Cordero to Sally Morgan. San Francisco, CA, September 28, 2021.
[78] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 62.
[79] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 79; Cordero, Jonathan, "Native Persistence: Marriage, Social Structure, Political Leadership, and Intertribal Relations at Mission Dolores, 1777–1800." *Journal of California and Great Basin Anthropology* Vol. 35, Issue 1, p. 140.
[80] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978.

population of a given village, and in village locations. For instance, Spanish Franciscan missionary Francisco Palou notes of the peninsula's San Andreas Valley in 1774.

> *The first expedition that passed here did not give it a name on account of not finding any villages, while now, in the short stretch we have traveled we have found five large ones. From this it is inferred that the country is well populated and that the inhabitants move their villages readily from place to place.*[81]

Like other Ohlone tribes, the Yelamu were hunter-gatherers, who acquired and used a wide variety of plant and animal resources including many varieties of terrestrial and marine game, fish and shellfish, and many species of plants. The primary foods collected and used likely varied seasonally and from year to year, and also over time, depending on the food sources available in the environmental setting of a particular village or territory, available labor, local preferences, and annual resource productivity. Where desirable species of oak were present, acorns were a plant food staple for many central California groups, including most Ramaytush groups. A variety of seeds, berries, roots, nuts, fruits, fish, mammals, reptiles, and insects were also consumed.[82] To improve and maintain seasonal resource sustainability, the Ohlone actively managed the landscape, clearing the land through controlled burning, tilling, and seed broadcasting, irrigating, weeding, and pruning, to strategically improve browse for game animals and habitat for desirable plants. Controlled burning not only helped replenish the soil and assist in management of plant resources, but also often delineated territories. Individual families and bands might be associated with particular burn zones and resource collection areas.[83] The intimacy and depth of Ohlone knowledge of plants of both the land and the sea for food, medicinal, and other uses is detailed in anthropologist J.P. Harrington's notes of interviews regarding Ohlone ethnobotany.[84]

For groups who had access to the bay shore or ocean coast, which seems to have been the case throughout San Francisco, shellfish were an important dietary stable. These were both collected from rocks and tidepools at low tide and harvested from sand and mud flats. The importance of shellfish to San Francisco Ohlone is reflected not only in the fact that shellfish shells are a major constituent of most archeological deposits in San Francisco, including one site dated to 7,900 years old, but also in the use of Olivella and abalone shells as raw material for the manufacture of currency, ceremonial ornaments, as trade goods, and as grave offerings.

Both archeological findings from sites around Mission Bay and elsewhere in San Francisco[85] and ethnographic studies document the rich inventory of other animal resources of the sea and shoreline marshes harvested by the Ohlone. Fish, ranging in size from anchovies to sturgeons, were obtained using methods adapted to site setting and the size and habitat of the game. Fiber nets with drilled or grooved stone weights were cast from

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[81] Bolton, H. E., editor and translator, *Historical Memoirs of New California*, by Fray Francisco Palóu, O.F.M., Translated into English from the manuscript in the archives of Mexico, University of California Press, Berkeley, 1926, p. 272.

[82] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, pp. 491–493; Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 20; Milliken, R. T., *An Ethnohistory of the Indian People of the San Francisco Bay Area from 1770 to 1810*, Berkeley, CA: University of California Press, 1991, pl 31; Kroeber, A.L., *Handbook of the Indians of California*, Bureau of American Ethnology Bulletin 78. Washington, D.C., 1925, p. 467.

[83] Lightfoot, K. G., O. Parrish, L. M. Panich, T. D. Schneider, and K. E. Soluri, California Indians and Their Environment: An Introduction. Berkeley, CA: University of California Press, 2009, pp. 82–83.

[84] Harrington, J.P., *John Peabody Harrington papers: Costanoan (part 3), 1921–1939*. Smithsonian Museum of Natural History. Washington, DC. https://learninglab.si.edu/resources/view/216584.

[85] For example, among many others: AECOM. Archeological site record for SFR-220, a submerged deposit 7,900 years old. Confidential record on file California Historical Resources Information System, Sonoma State University.2020; Byrd, B, J. Berg and J. Meyer. Archaeological Data Recovery at the Yerba Buena Site (CA-SFR-114) for the Moscone Center Expansion Project, San Francisco. 2018. On file under Planning Dept, Case No. 2013.0154E, San Francisco Planning Department

shore or from tule boats to capture schooling fish, while stone, shell or bone hooks on fiber lines were used for larger fish. Sturgeon or large salmon were harpooned with spears tipped with finely fashioned stone tips. Fish weirs facilitated mass captures at low tide of shallow-water fish of the marsh, such as bat rays. Stranded whales were used both for meat and for their bones.

Harpoons also were used to hunt sea otters and other sea mammals, which provided meat and also furs that were valued both for their warmth and as trade goods. The Ohlone used nets, bow and arrow, and spear and atlatl to hunt waterfowl and wide range of other animals who frequented the marshes and the shore, including tule elks, bear, deer, and rabbits. The Ohlone made use not only of the meat provided by these animals, but also of their sinews, bones, fur and feathers. Animal bones were used in the manufacture of a plethora of items, including harpoon and spear tips, whistles, hide scrapers, drills, gaming pieces, and ornaments.

Ohlone also made and used a wide range of basketry items, and a variety of chipped and ground stone tools, primarily from locally available materials, with the exception of obsidian, which was obtained in trade. Ohlone tribes also engaged in trade, both locally and with tribes throughout California and beyond. Milliken notes, "The Yelamu tribe probably played a key role in regional trade, moving obsidian and other goods from the north and east across the Bay and down the Peninsula, while bringing coastal shells to the East Bay."[86] The primary trading partners of the Ohlone were the Coast Miwok, Pomo, Yokuts, and Wappo tribes. Exports included mussels, salt, abalone shells, dried abalone meat, Olivella shells and, likely, sea otter pelts.[87] The Ohlone imported piñon nuts, which were obtained from the Yokuts,[88] and locally unavailable lithic materials. Obsidian for stone tools was obtained through a trade network that stretched north to Santa Rosa and Napa and eastward over the Sierra Nevada to the Owens Valley. Trade feasts called together tribal and tribelet neighbors for social and ceremonial gatherings. These trade feasts served to redistribute wealth and provided opportunities for groups to socialize, form alliances, and exchange trade goods across different regions.[89]

Spanish colonization in the San Francisco Bay Area began with the establishment of several missions and associated Presidios (military outposts) in the last quarter of the 18th century. Mission San Francisco de Asís (Mission Dolores) and the San Francisco presidio, established in San Francisco in 1769, marked the initial non-native arrival and settlement in San Francisco. The purpose for establishing these outposts was to extend and enforce Spain's control over California, in large part by converting California Native Americans to Catholicism and enslaving them as a Spanish labor source. The subsequent, often forceable recruitment of Native Americans into the mission system resulted in catastrophic social upheaval and demographic decline for the region's native Ohlone inhabitants. The Yelamu, like other Ohlone groups, were subjected to disruption of traditional subsistence patterns and cultural practices, physical punishment, and new forms of labor discipline. Native people who had entered the mission system were generally prohibited from returning to their homes except for occasional visits, which greatly hampered native peoples' ability to maintain traditional practices and ties to community and land. A variety of factors contributed to high death rates at the mission, including austere living and working conditions imposed by the Spanish, and European diseases. More than a

[86] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, p. 62.
[87] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, p. 488.
[88] Davis, J. T., *Trade Routes and Economic Exchange Among the Indians of California*, Berkeley, CA: University of California Archaeological Survey Reports 54. Reprinted in *Aboriginal California: Three Studies in Culture History*. R. F. Heizer, ed. Berkeley, CA: University of California Press, 1961, p. 23.
[89] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995, pp. 21–24.

quarter of the mission Indian population of the San Francisco Bay Area died of the measles or related complications between March and May 1806.

Based on Spanish records, the last Ohlone elder from the San Francisco Peninsula was baptized at Mission San Francisco in 1801.[90] The Spanish sources report that the villages of San Francisco and the vicinity were vacant by this time, or nearly so. While some Ramaytush Ohlone possibly had fled to remote refuge sites or to reside with more distant tribes, most apparently either had died or were resident at the missions at the start of the 19th century.[91] The total Ohlone population bay area-wide decreased from between 7,000 and 17,000 in 1770 (based on various estimates by Kroeber,[92] Cook 1940, 1943a;[93] and Milliken et al.[94]) to fewer than 2,000 in 1832.[95]

Ohlone peoples were brought into the mission system at missions San Carlos Borromeo, San Francisco de Asís, Santa Clara de Asís, Santa Cruz, and San José. Mission Dolores on the San Francisco Peninsula absorbed Ohlone peoples as well as other California indigenous tribal groups including the Esselen, Yokuts, Miwok, Pomo and Patwin. Although, in theory, Native American mission converts were to be trained in agricultural practices at the mission and then "granted" land and materials to establish their own farms, in practice no such land grants to Ohlone converts occurred in San Francisco. By the time of the secularization of the missions in 1834, a new class of Hispanic rancho landowners had arisen. The Native American survivors of the mission system, who had been deprived of the ability to pursue native subsistence practices on their own land, were exploited as labor for Hispanic crop cultivation, cattle raising, production of hide and tallow, and delivery to Yerba Buena cove (the location of the fledgling port of San Francisco).[96] Some of these Native American laborers may have lived in the settlement at Yerba Buena at least part time during the 1830s and 1840s, but whether these included persons of Ohlone descent is unknown. Other Native Americans of various tribes who had resided at Mission Dolores relocated to ranchos on the San Francisco Peninsula. The main centers of Indian life and culture on the Peninsula after secularization were at Mission Dolores and Rancho San Mateo, 20 miles to the south,[97] and possibly the Sanchez Adobe, a former Mission Dolores outpost in Pacifica.

On July 9, 1846, during the Mexican American War, Army Captain John B. Montgomery claimed San Francisco for the United States. In the following year, a census recorded only 34 Native Americans (tribe not specified) in the San Francisco area.[98] With the discovery of gold in the Sierra Nevada foothills in 1848, gold seekers from around the world flooded into San Francisco, the closest seaport to the gold-rich foothills. As a result, the total

[90] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, Table 4, p. 2.
[91] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, p. 506.
[92] Kroeber, A.L., *Handbook of the Indians of California*, Bureau of American Ethnology Bulletin 78. Washington, D.C., 1925, p. 464
[93] Cook, Sherburne F., *Population Trends Among the California Mission Indians*, University of California Publications: Ibero-America, Volumes 17:1–48. Berkeley. Reprinted in 1976 as Part Five in *The Conflict between the California Indian and White Civilization*, University of California Press, Berkeley and Los Angeles, 1940; Cook, Sherburne F., *The Indian versus the Spanish Mission*. University of California Publications: Ibero-America 21:1–194. Berkeley. Reprinted in 1976 as Part One in The Conflict between the California Indian and White Civilization, University of California Press, Berkeley and Los Angeles, 1943.
[94] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 65.
[95] Levy, R., "Costanoan" in *California, Handbook of the Indians of North America*, Vol. 8, R. Heizer, ed. Smithsonian Institution, Washington, D.C, 1978, p. 506.
[96] Milliken, R. T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810*, Menlo Park, CA: Ballena Press, 1995.
[97] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 181.
[98] Soule, F., J. H. Gihon, and J. Nisbet, *The Annals of San Francisco*. D. Appleton and Company, New York, 1855, p. 178.

population of San Francisco grew from 600 in 1848 to 100,000 by 1849.[99] French traveler Ernest De Massey, who visited to Mission Dolores in 1849, recounted that, "[a]bout one hundred and twenty persons live around the mission. Most of them are Mexicans, Indians or half-breeds; Europeans and Americans are in the minority."[100] German traveler Friedrich Gerstaecker, who also visited San Francisco during the Gold Rush, noted that some Native American women who lived around Mission Dolores at that time were employed as domestic servants or took in washing and sewing for Hispanic families. Gerstaecker also notes that there were "still small bands of these Indians roving about, camping in the open air, and living on what they secure in some way, or beg from the settlers" (Gerstaecker quoted in Engelhardt).[101] With the flood of unemployed Caucasians during the mid-19th century, Native American labor was no longer sought after in urban areas.[102] Milliken et al. assert that Native American peoples continued to survive in urban areas, but that due to the challenges of finding work, low wages, and lack of housing, few individuals married or had children.[103]

California enacted a series of laws in the 1850s that codified the marginalization of the state's native peoples. In 1851, California's first governor called for a war of extermination to be waged "until the Indian race should become extinct."[104] Under this political regime, unemployed Native Americans could be arrested and sold as indentured laborers; orphaned Native American children could be taken and held in custody by white families until adulthood; and Native Americans were allowed virtually none of the rights of citizenship.[105] While not as physically violent as the state's sponsored bounties for murdering indigenous people in the mid-19th century, in practice these laws led to enslavement of native peoples.

Despite this adversity, Native peoples continued to persist on the San Francisco Peninsula.[106] Because of the disenfranchisement of people of native descent by this time, the census of native populations almost certainly was incomplete. However, a special California census of 1852 recorded only 140 Native Americans in San Francisco and San Mateo counties, and the US Census of 1860 reported only 93 Indians in San Francisco and San Mateo counties and fewer than 1,400 bay area-wide.[107] Milliken et. al[108] note that:

> *In the City and County of San Francisco, the 1860 and 1870 censuses document the disappearance of acknowledged Mission Dolores Indians from the public record and the emergence of an urban pan-California Indian community. Only 37 Indians were reported [in San Francisco] in 1860 and 45 in 1870, remarkably low figures in a total San Francisco population of over 57,000 (1860) and 149,000 (1870).*

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[99] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 182.
[100] DeMassey, Ernest, *A Frenchman in the Gold Rush*, Translated by Marguerite Eyer Wilbur. California Historical Society, San Francisco, 1927, p. 37.
[101] Engelhardt, Z., San Francisco or Mission Dolores. Franciscan Herald Press, Chicago, 1924, p. 318.
[102] Cook, Sherburne F., Migration and Urbanization of the Indians of California. Human Biology 15:33–45, 1943; Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 180.
[103] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 180.
[104] Hittell, T.H., *History of California*, Volume 3. N.J. Stone & Company, San Francisco, 1898, p. 899.
[105] Heizer, Robert F., and Alan F. Almquist, *The Other Californians: Prejudice and Discrimination under Spain, Mexico, and the United States to 1920*, University of California Press, Berkeley and Los Angeles, 1971; Castillo, Edward D., The Impact of Euro-American Exploration and Settlement, in *California. Handbook of North American Indians*, Volume 8, edited by Robert F. Heizer, pp. 99–127. Smithsonian Institution, Washington, D.C., 1978.
[106] Heizer, Robert F., and Alan F. Almquist, *The Other Californians: Prejudice and Discrimination under Spain, Mexico, and the United States to 1920*, University of California Press, Berkeley and Los Angeles, 1971, p. 26.
[107] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, Table 9, p. 179.
[108] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 188.

Due to the population shifts associated with missionization, these numbers likely included individuals representing or descended from Native groups outside of the San Francisco Bay Area, as well as those of Ohlone descent.

Today, there are no known living descendants of the Yelamu Ohlone who once occupied the land now known as the City and County of San Francisco. Until recently, anthropologists believed that the last known descendant of a native of the San Francisco Peninsula died in the 1920s. However, the Association of Ramaytush Ohlone includes families who descend from an Aramai Ramaytush Ohlone individual, whose origin was a village in Pacifica. Geographically, these families are the closest known Ohlone descendants to the native bands of San Francisco, and the only known living descendants of the Ramaytush Ohlone peoples.[109]

Ohlone recognition and political assertion gained momentum during the early twentieth century, spurred in part by legal suits brought against the U.S. government for reparation due to the Indians of California for the theft of traditional lands. In 1928, under the Indian Land Claims Act, the state established a new roll of Native American descendants and, eventually, provided small reparations payments in which some Ohlone participated.[110] More importantly, these lawsuits brought more attention to the rights of California's indigenous peoples and inspired a new focus on the reevaluation of rights due to the community and its members.[111]The political organization necessary to mount legal actions led to the formation of Native American advocacy groups throughout California, including a number of Ohlone groups.

Although none of the Ohlone tribes has yet been formally recognized by the federal government, a number of Ohlone groups have been politically active since the 1920s and increasingly by the 1960s in efforts to obtain federal recognition and renewed land rights; to preserve ancestral burial sites and control the treatment of ancestral human remains; to preserve and renew their ancestral heritage, cultural traditions and languages; and in community advocacy on American Indian issues.

In response to Native American advocacy and to broader social justice movements, the San Francisco Board of Supervisors has formally acknowledged the Ramaytush Ohlone community as the indigenous and sovereign people of the City and County of San Francisco.[112] This following acknowledgement is read at the opening of each Board meeting:

> *The San Francisco Board of Supervisors acknowledges that we are on the unceded ancestral homeland of the Ramaytush Ohlone, who are the original inhabitants of the San Francisco Peninsula. As the indigenous stewards of this land and in accordance with their traditions, the Ramaytush Ohlone have never ceded, lost, nor forgotten their responsibilities as the caretakers of this place, as well as for all peoples who reside in their traditional territory. As guests, we recognize that we benefit from living and working on their traditional homeland. We wish to pay our respects by acknowledging the Ancestors, Elders, and Relatives of the Ramaytush Ohlone community and by affirming their sovereign rights as First Peoples.*

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[109] Milliken, R., L. Shoup and B. Ortiz. *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, Prepared by Archaeological/Historical Consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, California, 2009, p. 2.

[110] Many individuals who identify as Ohlone today descend from individuals listed as "Mission Indians" in the 1928 Lands Claim Act rolls. This not only reflects, but also has contributed to, the long-term struggle of Ohlone groups to obtain formal tribal recognition by the federal government.

[111] Lowell Bean. The Ohlone Past and Present: Native Americans of the San Francisco Bay Region. Ballena Press Anthropological Papers, No. 42, Menlo Park, CA. 1994:xxiv.

[112] San Francisco Board of Supervisors, Motion amending the Rules of Order of the Board of Supervisors by adding Rule 4.7.1 to require the President to read a statement acknowledging the Ramaytush Ohlone community. Approved December 8, 2020, https://sfgov.legistar.com/View.ashx?M=F&ID=9014184&GUID=D71B710F-9C5C-4094-8133-ACC7507D47F1.

City Commissions and departments have also incorporated this land acknowledgment into their public hearings and public materials. In addition, the City and County of San Francisco recognized the Ramaytush Ohlone as the original peoples of San Francisco County in the Indigenous Peoples' Day Proclamation of 2019.[113]

Additionally, at the encouragement of and in consultation with the Native American community and other groups, the Planning Commission and the Historic Preservation Commission passed resolutions in the summer of 2020 apologizing for the history of racist, discriminatory and inequitable historic preservation and planning policies and practices in San Francisco, and committed to centering the work program of the Planning Department on racial and social equity; specifically, to increasing the involvement of historically disenfranchised communities, including Native American peoples.[114]

AMERICAN INDIAN CULTURAL DISTRICT

In addition to the Ohlone people who are traditionally and culturally affiliated with San Francisco, San Francisco is home to a vibrant American Indian community that includes Native Americans from tribes across the nation. In the 1950s, the federal government implemented a program to relocate rural Native Americans from their traditional lands to urban areas, with the intent of promulgating "cultural assimilation." San Francisco was one of the principal relocation destinations, and the city's Mission District became a home base for many relocated people. Native Americans arriving in the city, separated from their community support systems, were not provided adequate government and social services. The growing Native American pan-Indian community in the Mission developed its own support systems to fill the void, included social services; help with employment and housing; and opportunities for political empowerment. The community also came together to develop cultural and educational programming, preserve native languages and cultural traditions, establish community gathering spaces, and sponsor community events, including some of the first urban pow wows. One of the hubs for these activities was the first San Francisco American Indian Center founded in the 1940s. These American Indian-based enterprises and the rich cultural history of the area are at the heart of the San Francisco American Indian community. In 2020, at the behest of representatives of the American Indian Center, including Ramaytush Ohlone representatives, the City and County of San Francisco formally recognized an American Indian Cultural District, in San Francisco's Mission District. The recognition of this cultural district and the ongoing activities of the American Indian Center are part of the ongoing work of the indigenous community for recognition and equity.

IDENTIFICATION OF TRIBAL CULTURAL RESOURCES

Pursuant to California Government Code section 65352.3, the Native American Heritage Commission (NAHC) maintains a list of traditionally and culturally affiliated tribal representatives for consultation for each county in California. This list includes representatives of federally recognized tribal groups, as well as tribal groups that are traditionally and culturally affiliated with each area. In light of barriers to the identification of modern tribes or individuals who are culturally and traditionally affiliated with specific locations in the San Francisco Bay Area (as discussed is the preceding section of this document), the NAHC list of tribal representatives for San Francisco Bay Area counties was initially open to all individuals and groups that requested to be listed as Native American tribal representatives and are able to trace their descendancy from Mission Indians on the Indian Claims Act tribal rolls, irrespective of affiliation with a specific subregion of the San Francisco Bay Area.

[113] Ordinance No. 221-19 amending City and County of San Francisco Administrative Code Section 1, Article 1, Chapter 16.4, https://sfgov.legistar.com/View.ashx?M=F&ID=7788560&GUID=DB0EB445-4F0D-4795-9DC4-0FA9E60229FD.
[114] San Francisco Historic Preservation Commission, Resolution No. 1127 Centering Preservation Planning on Racial and Social Equity, adopted July 15, 2021, https://sfplanning.org/sites/default/files/documents/admin/R-1127_HPC_Equity_Resolution.pdf.

On this basis, the NAHC lists a number of Ohlone tribes as traditionally affiliated with San Francisco Bay Area counties, including representatives for San Francisco, and updates this list regularly to reflect changes in tribal organization. Ohlone individuals who might be loosely affiliated with a tribal group but have not formally enrolled in a group or been appointed as a group's representative have also been included on past NAHC lists.

It should be noted that the NAHC tribal consultation list is not, nor is it intended to be, a comprehensive roll of Native Californian individuals or groups. Groups who wish to be listed apply to the NAHC, and the commission has a process for evaluating those applications. Some individuals or groups, such as the Association of Ramaytush Ohlone, have elected not to apply and are not presently listed as formal tribal representatives, but research has identified a Ramaytush Ohlone tribal ancestor from a village south of San Francisco who has living descendants who are represented by the Association of Ramaytush Ohlone.[115] The planning department consults with both tribal representatives and with Ohlone groups or individuals who are not presently listed by the NAHC, but who are recognized in the Ohlone community.

In 2015, the department undertook discussions with Ohlone tribes on the NAHC list for San Francisco regarding tribal cultural resources in San Francisco. Based on these discussions, all archeological resources of Native American origin in San Francisco are presumed to be potential tribal cultural resources unless determined otherwise through subsequent Ohlone consultation. Through the 2015 outreach, preservation in place under a preservation plan was identified as the preferred measure to mitigate potential impacts to Native American archeological tribal cultural resources. If preservation is infeasible, it was agreed that an interpretive program would be developed and implemented with the participation of the consulting Native American representative. The department also identified procedural requirements for notification, tribal consultation procedures, and a description of the types of archeological sites that would be presumed to be tribal cultural resources. No known or potential tribal cultural resources aside from Native American archeological sites in San Francisco were identified at that time.

The department renewed general outreach (that is, citywide, not project-specific) to Native American contacts in January 2021. The renewed outreach confirmed, that Native American archeological resources should still be presumed to be potential tribal cultural resources and that preservation in place and public interpretation were still considered appropriate mitigation measures for significant impacts.

On September 2, 2020, the planning department sent out tribal notification of the opportunity to consult on the Waterfront Plan EIR. The letter explained that, while there are no known near-surface Native American archeological resources within the Waterfront Plan area that could be affected by project soil disturbances, as the Plan area is limited to areas that were under the waters of the bay prior to placement of bay fill in the 19th and 20th centuries, there is the potential for submerged and deeply buried Native American archeological resources to be present in some areas that could be subject to development under the Plan (as detailed in Section E.4, Cultural Resources, above).

On June 2, 2021, the planning department sent out a second round of notification letters of the opportunity to consult on the Waterfront Plan EIR to the NAHC list and the department tribal consultation list based on updates in these lists. In response to the notifications, the planning department received two requests for consultation, one from Kanyon Sayers-Rood, representing the Indian Canyon Mutsun Band of Costanoan Ohlone People, and one from Jonathan Cordero and Gregg Castro, representing the Association of Ramaytush

[115] Milliken, R., R. Fitzgerald, M. Hylkema, R. Groza, T. Origer, D. Bieling, A. Levanthal, R. Wiberg, A. Gottsfield, D. Gillette, V. Bellifemine, E. Strother, R. Cartier, and D. Fredrickson, Punctuated Cultural Change in the San Francisco Bay Area. In *California Prehistory: Colonization, Culture, and Complexity*, edited by T. L. Jones and Kathryn A. Klar. Walnut Creek, CA: AltaMira Press, 2007, pp. 99–124.

Ohlone. Within 30 days of receipt of these requests, the planning department initiated consultation with these parties. Consultation was concluded in November 2021 and the outcome of that consultation is summarized below.

As discussed under Section E.4, Cultural Resources, the planning department concluded that the Waterfront Plan area is sensitive for the presence of submerged Native American archeological resources, which, based on tribal consultation, are presumed to be tribal cultural resources.

The shoreline is also sensitive for the presence of potential tribal cultural resources that may or may not be physically represented by archeological deposits. Native American representatives have indicated that the cultural significance of the bay shoreline extends beyond the presence of Native American archeological resources alone, based on its symbolic cultural value. The values tribal representatives associate with the shoreline are exemplified by the ecological relationship between the existing shoreline, the waters of the bay and the creeks that feed it, the natural resources of the shore, the Native people who reside and have resided on the shore, and the changing spatial relationship between the land and the water. Native American representatives identified the shoreline—the interface zone between the land along the bay shore and the waters of San Francisco Bay—is sensitive for the presence of potential non-archeological tribal cultural resources. While the Waterfront Plan area has seen large-scale landscape changes caused by rising sea levels and the placement of bay fill in the 19th and 20th centuries, the shoreline as it exists today is valued by Ohlone tribes as an important source of traditional animal and plant resources and also as the physical representation of the Ohlone relationship with the shoreline, as both beneficiaries and stewards of the land and the water.

The cultural importance of the shoreline to the Ohlone is clearly demonstrated in the ethnographic record by extensive evidence of the importance to Ohlone lifeways of a wide variety of shoreline and bay resources including the development and use, by the Ohlone, of a range of elaboration of strategies and technologies, including specialized tools, strategies and methods for their acquisition, processing, and storage, as discussed under Ethnography and Ethnohistory of the Plan Area, above. San Francisco's archeological record, extending back almost 8,000 years, also supports the high and enduring importance of the shoreline to native peoples, who are documented to have lived along the San Francisco shore during this period. Materials found in Native American archeological deposits in San Francisco, clearly substantiate the importance of bay and bay shore resources in the Ohlone diet and material culture and in their ritual and ceremonial life. The values tribal representatives associate with the shoreline are exemplified by the ecological relationship between the existing shoreline, the waters of the bay and the creeks that feed it, the natural resources of the shore, the Native people who reside and have resided on the shore, and the changing spatial relationship between the land and the water.

Tribal representatives also noted that they have a strong interest in understanding and reconstructing the environmental settings and landscapes in which they lived prior to the historic period, and the ways in which these have changed over the past 8,000 years—the period during which Native Americans are documented to have been residing in San Francisco—because of the essential place the local natural environment holds in Ohlone values and cultural heritage. In San Francisco, buried soil deposits that may have been on the surface during the long period of Native occupation have been demonstrated to have the potential to provide paleoenvironmental data—that is, information about plant species, wetlands and other water resources, wildfires, rainfall, and other environmental factors, and changes over time in these elements—that are critical in the reconstruction of past environments. The potential to provide paleoenvironmental data further enhances the tribal cultural value of locations such as past shoreline zones, and associated marshlands and creek corridors where soils that preserve such data (paleoenvironmental deposits) are likely to be present.

In asserting the tribal cultural resource value of the shoreline, tribal representatives acknowledge that the character and location of the shoreline has changed markedly over time. In the several thousand years prior to European contact, rising sea levels created the bay and then extensive shoreline marshes. Starting in the 1830s, landfill in the bay and the development of seawalls, wharves and piers created a built environment along the shore and moved the waterfront bay-ward. The historical and modern changes that produced the modern shoreline are only the latest chapter in this change. On this basis, the tribal connection with the shoreline is not only related to specific historical locations and the paleoenvironmental information they contain (that is, the European contact-period shoreline, which is now deeply buried under San Francisco's South of Market and Financial districts), but also on the identifiable physical locations where the water/shore relationship is manifested today. Locations that exemplify tribal cultural values of the bay shoreline today are those where public access to the water's edge is available today, and where native shoreline vegetation is still present (today, primarily in the southern portion of the Waterfront Plan area).

IMPACTS AND MITIGATION MEASURES

The Waterfront Plan proposes updated and new goals and policies that would expand the scope of direction and guidance for future waterfront improvement projects, as described in Chapter, Project Description, of this Draft EIR. As further detailed in the discussion below, the consultation for the Waterfront Plan EIR included discussion of pertinent Waterfront Plan policies, which tribal representatives agreed align with tribal cultural values. However, concerns were raised in the consultation regarding two types of potential tribal cultural resource impacts that could occur from certain types of subsequent projects advanced under the Waterfront Plan, as described above: (1) Native American archeological resources and (2) non-archeological tribal cultural resources associated with the shoreline interface between the land and the waters of San Francisco Bay. The nature of potential impacts to each are detailed below under Impacts TCR-1 and TCR-2, respectively.

Impact TCR-1. The Waterfront Plan could result in a substantial adverse change in the significance of an archeological tribal cultural resource. ***(Less than Significant with Mitigation)***

Based on preliminary archeological review of the Waterfront Plan (as detailed in Section E.4, Cultural Resources), there is the potential for Native American archeological resources that represent tribal cultural resources to be present in within the Waterfront Plan area. As noted above, all Native American archeological resources in San Francisco are presumed to be potential tribal cultural resources. In most of the plan area, these would be expected to consist primarily of archeological deposits submerged and buried under bay bottom sediments between about 8,000 and 2,000 years ago, as the San Francisco Bay formed and expanded in size as the result of rising sea levels. Subsequent projects that may occur as a result of adoption of the Waterfront Plan could include construction of buildings or structures that require deep foundations, pile driving and/or deep soil improvements that extend below the bay floor. Deep soil disturbance by this construction would have the potential to disturb or destroy submerged and buried Native American archeological sites that are tribal cultural resources. Damage to or destruction of such a resource would be considered a significant tribal cultural resources impact.

As discussed in Section E.4, Cultural Resources, department procedures require preliminary archeological review of any subsequent project proposed under the Waterfront Plan that would disturb soils to a depth greater than 5 feet. If this review leads the department to determine that there is the potential for Native American archeological resources to be present within a proposed project footprint and to be disturbed by project construction, this would be a significant impact, which would trigger the required implementation of Cultural Resources Mitigation Measures M-CR-2a, Procedures for Accidental Discovery of Archeological

Resources for Projects Involving Soil Disturbance; M-CR-2b, Archeological Monitoring; M-CR-2c, Archeological Testing; and/or M-CR-2d, Treatment of Submerged and Deeply Buried Resources, as determined applicable by the ERO described in Section E.4.

In addition, to ensure that Native American tribal representatives are proactively notified and provided the opportunity to consultant on tribal cultural resource questions and concerns, implementation of **Mitigation Measure M-TCR-1, Tribal Notification and Consultation**, as detailed under Impact TCR-2, p. 82, would be required. The applicable cultural resource mitigation measures listed above, together with Mitigation Measure M-TCR-1, would fully mitigate any significant impact to a Native American archeological tribal cultural resource. Based on tribal consultation conducted for the Waterfront Plan EIR, Mitigation Measure M-TCR-1 requires notification to Native American tribal representatives regarding environmental review for subsequent development projects under the Waterfront Plan EIR that the department determines have the potential for Native American archeological resource impacts. If consultation is requested by a California Native American tribal representative, the measure specifies that consultation on archeological tribal cultural resources would focus on, but not be limited to, opportunities for tribal representatives to provide input on treatment and interpretation of archeological resources and to participate in archeological treatment, if so desired.

With implementation of Mitigation Measure M-TCR-1, along with Mitigation Measures M-CR-2a, M-CR-2b, M-CR-2c, and/or M-CR-2d, the potential for significant impacts from subsequent projects that could occur under the Waterfront Plan on Native American archeological tribal cultural resources would be ***less than significant with mitigation***.

Impact TCR-2. The Waterfront Plan could result in a substantial adverse change in the significance of a non-archeological tribal cultural resource. ***(Less than Significant with Mitigation)***

As detailed above, based on tribal consultation, the San Francisco Bay shoreline zone, portions of which lie within the Waterfront Plan area, is also sensitive for the presence of tribal cultural resources that are not archeological in nature, as well as for archeological tribal cultural resources. Based on consultation, Native American's have strong cultural ties with the bay shoreline, today and in the past, based on their native environmental/traditional cultural associations, and as potential sources of data important to Native American cultural and/or environmental reconstruction. Along the shoreline, tribal cultural resources are embodied by locations that provide access to the shoreline or native vegetation along the shoreline. The sustainable use of the shoreline, including long term and ongoing protection of land and water quality, protection and enhancement of native vegetation and habitats, and sensitive public interpretation of tribal values and heritage are culturally important to local Native Americans as identified through consultation.

Non-archeological tribal cultural resources of the shoreline may be present at locations where public access to the water's edge is available today; where native shoreline vegetation is still present (today, primarily in the southern portion of the Waterfront Plan area); or where soils with the potential to provide paleoenvironmental data about the environment during the last 8,000 years of documented Native American habitation may lie buried.

The Waterfront Plan focuses predominantly on adaptive reuse and rehabilitation of existing buildings and piers, and leases within of existing buildings and facilities. It envisions waterfront and open space improvements along the shoreline, enhancement of recreational uses in the bay, improvements to existing maritime uses, and planning to support the Port's waterfront resilience program. In addition, six possible

subsequent project sites where new development is anticipated to occur have been identified, including three sites along or over the waterfront and associated waterways, in the interface between the land and bay waters: Piers 30–32, Pier 70 Triangle, and Pier 90 sites (see Figure 4-1, p. 4-7).

This subsequent development under the Waterfront Plan could result in significant impacts to non-archeological tribal cultural resources if the development would:

- Impede public access to the shoreline;
- Remove or substantially alter native vegetation;
- Disturb soils that could provide data about the native environmental setting and how it has changed over time and therefore result in the loss of these data;
- Result in environmentally unsustainable development; or
- Impair water quality.

The Waterfront Plan includes new objectives (see Chapter 2, Project Description, of this Draft EIR) that align with protection of the characteristics of the shoreline identified as important to tribal values that would provide policy direction to support tribal cultural resources and values described in consultation and should limit the potential for impacts due to development of subsequent projects under the Waterfront Plan. For example, the objectives listed below focus on expanding public access and advancing environmental sustainability:

- **Objective 3.** Complete, enhance, and activate the Port's network of parks, public access, and natural areas along the 7.5-mile bay shoreline to provide recreational, social, and open space benefits for residents and visitors of all races, ages, and abilities, including historically marginalized communities.
- **Objective 4.** Support a vibrant urban waterfront with commercial and industrial businesses, and public-oriented entertainment, civic, cultural, and recreational activities that respect maritime needs, activate waterfront parks, and equitably serve and attract visitors of all races, ages, and economic means.
- **Objective 6.** Design waterfront projects that highlight visual and physical connections to the city and San Francisco Bay, promote rehabilitation of Port maritime historic and cultural resources, and respect the character of adjacent neighborhoods.
- **Objective 8.** Limit the impacts of climate change, improve the ecology of the bay and its environs, and ensure healthy waterfront neighborhoods by meeting the highest standards for environmental sustainability, stewardship, and justice.
- **Objective 10.** Strengthen Port public engagement to increase understanding of Port and community needs, including historically marginalized communities of color, to lease and project approval processes, and to promote public agency partnerships to align policies and regulations to achieve waterfront projects and programs for the benefit of San Francisco and California.

The Waterfront Plan also includes specific goals and policies that promote sustainable development and use of open space; increased public access to and engagement with the waterfront, which are also consistent with the tribal cultural values identified during consultation; and preservation and enhancement of native

vegetation. Further, these goals and policies promote engagement of diverse perspectives that are consistent with the consideration of tribal cultural resources in the shaping new waterfront projects. These include:

- Work with partners to enhance connections between the city, waterfront, and the Bay and nature. Encourage interpretive exhibits and information to enhance public understanding and enjoyment of the Bay, the historic waterfront and the natural environment. (Open Space, Policies 11, 17);
- Avoid significant impediments to existing public access and view areas. Preserve and enhance existing natural shoreline edges to the maximum feasible extent. (Open Space, Policies 22–23);
- Strengthen the identity of the Port and enhance the public realm. Provide interpretive information that communicates the waterfront's architectural, maritime, and cultural history including sharing Port history through oral histories, interpretation, and cultural exhibits. (Urban Design and Historic Preservation, Policies 4–5);
- Provide waterfront views, shoreline public access, or direct access to and from the Bay for visitors' enjoyment of the natural environment. (Urban Design and Historic Preservation, Policy 7); and
- Protect and enhance the biodiversity of the Port's natural resources including implementing best sustainable practices in Port leasing, new and redevelopment projects, open spaces, and the public realm. (Environmental Sustainability, Policies 4–5).

In addition to Waterfront Plan policies, there are several existing regulatory requirements that would apply to subsequent shoreline projects under the Waterfront Plan to protect water quality and biological resources, and avoid or remove hazardous materials. These are described under Section E.17, Hydrology and Water Quality; Section E.15, Biological Resources; and Section E.18, Hazards and Hazardous Materials, as applicable to subsequent projects that could be developed under the Waterfront Plan. The Waterfront Plan includes new policies that require the Port to coordinate with the appropriate city agencies to ensure that future development that occurs under the Waterfront Plan improves water quality, avoids increased pollution, and complies with sustainable design requirements (Environmental Sustainability Policies 2–5). Therefore, subsequent development under the Waterfront Plan is not expected to result in increased pollution or environmentally unsustainable design, and therefore would not be expected to result in significant impacts to potential non-archeological tribal cultural resources with respect to land or water pollution or unsustainable land uses.

The Waterfront Plan objectives, goals, and policies are proposed to expand Port Commission direction and guidance for all leases, adaptive reuses and improvements, and new development of Port properties that meet public needs and values identified in the public planning process. During tribal consultation for the Waterfront Plan EIR, tribal representatives agreed that the Waterfront Plan includes policies that are consistent with the expressed tribally valued characteristics of the waterfront, as discussed above. They also agreed that development under the Waterfront Plan may provide opportunities to enhance waterfront characteristics that are culturally valued by the tribes. However, even if these policies are applied in a manner that is consistent with tribal cultural perspectives, subsequent projects that involve substantial changes along the shoreline have the potential to reduce the tribal cultural value of such locations with respect to access to the bay shoreline, reduce native vegetation, or result in the loss of culturally valued environmental data significant to historical landscape reconstruction. In such a case, a subsequent project could result in substantial adverse changes to non-archeological tribal cultural resources associated with the bay shoreline, which would be a significant impact.

Through consultation, Native American representatives identified that potential impacts from subsequent projects that are developed under the Waterfront Plan would be primarily limited to projects located within

the immediate shoreline band that would reduce public access, remove native vegetation along the shoreline, or that would entail soil disturbance deep enough to potentially encounter submerged Native American archeological sites or submerged paleoenvironmental deposits. Due to their reduced scale and intensity, small or maintenance-type projects that comply with the updated Waterfront Plan policies discussed above are unlikely to involve substantial changes along the shoreline that would result in substantial adverse changes to non-archeological tribal cultural resources.

Therefore, subsequent projects that potentially would result in a significant impact to non-archeological tribal cultural resources include the following:

- Long-term waterfront development projects (50- to 66-year lease terms) along the bay shoreline or piers extending in the bay, including three subsequent projects sites projected for new development: Piers 30–32, Pier 70 Triangle site, and Pier 90;
- New construction or major redesign of waterfront open spaces (as determined by the ERO), and public access interpretive exhibits and programs located along the shoreline or on piers extending over the Bay, such as interpretive exhibits along The Embarcadero Promenade or the Blue Greenway;
- Substantial habitat removal or restoration projects, excluding Port maintenance activities or minor improvements; or new construction or major redesign project (as determined by the ERO) that would include habitat removal or restoration as a component of the proposed improvements;
- Projects involving substantial (as determined by the ERO) shoreline stabilization or improvement, including development of natural infrastructure (wetlands, horizontal levees, living shorelines).

Whether these subsequent projects would result in significant impacts to shoreline tribal cultural resources would depend on the specifics of their design and implementation. Such impacts may be avoided if Waterfront Plan policies are reflected and implemented in subsequent projects in ways that are sensitive to the cultural values identified by the tribes. As identified by tribal representatives through consultation, the most effective way to assess whether a proposed subsequent development project would result in impacts to a non-archeological tribal resource is through notification of and consultation with Native American tribal representatives at that time that a subsequent project is proposed.

For subsequent projects with the potential to result in impacts to shoreline tribal cultural resources, as identified above, implementation of Mitigation Measure M-TCR-1, Tribal Notification and Consultation, would be required.

Mitigation Measure M-TCR-1: Tribal Notification and Consultation.

Summary. Mitigation Measure M-TCR-1, Tribal Notification and Consultation, requires notification of tribal representatives during project-level environmental review of specified types of subsequent projects detailed below. Notification would provide tribal representatives with the opportunity to consult and provide input on whether a tribal cultural resource is present at the subsequent project site, and on whether the subsequent project as proposed would diminish the cultural value of that tribal cultural resource. Consultation under M-TCR-1 would provide opportunities for tribes to review and participate in developing measures to reduce or avoid tribal cultural resource impacts. This measure applies to both archeological tribal cultural resources and non-archeological tribal cultural resources.

Applicability. This measure is applicable for the following types of subsequent projects under the Waterfront Plan:[116]

- Notification for Native American archeological tribal cultural resources:
  - Projects for which the planning department's preliminary archeological review identifies potential impacts to a Native American archeological resource;
  - After the discovery of a significant Native American archeological resource, and when planning for public interpretation of the resource is being initiated.
- Notification for non-archeological tribal cultural resources located along the shoreline:
  - Long-term waterfront development projects (50- to 66-year lease terms) along the bay shoreline or piers extending in the bay, including three subsequent projects sites projected for new development: Piers 30–32, Pier 70 Triangle site, and Pier 90;
  - New construction or major redesign of waterfront open spaces (as determined by the ERO) and public access interpretive exhibits and programs located along the shoreline or on piers extending over the Bay, such as interpretive exhibits along The Embarcadero Promenade or the Blue Greenway;
  - Substantial habitat removal or restoration projects (as determined by the ERO), excluding Port maintenance activities or minor improvements; or new construction or major redesign project that would include habitat removal or restoration as a component of the proposed improvements;
  - Projects involving substantial (as determined by the ERO) shoreline stabilization or improvement, including development of natural infrastructure (wetlands, horizontal levees, living shorelines).

Notification. The San Francisco Planning Department shall distribute a notification regarding the subsequent Waterfront Plan projects and programs to the NAHC tribal representative list and others included on the department's Native American tribal distribution, include the Association of the Ramaytush Ohlone and other Ohlone interested parties list. The notification would be conducted during project-level environmental review of the types of subsequent projects specified above. The notification shall include a description of the subsequent project, location, anticipated depth and extent of soil disturbance necessary for construction, and information on changes to public access, removal or addition of native planting or habitat, and any proposed public interpretation as relevant; the conclusions of the preliminary archeological review regarding potential impacts to Native American archeological tribal cultural resources; anticipated next steps, including proposed archeological identification and/or treatment for archeological tribal cultural resources; an invitation to consult on the project; and a timeline for requesting consultation, which is within 30 days after receipt of a notification.

For subsequent projects for which the planning department's preliminary archeological review identifies potential impacts to a Native American archeological tribal cultural resource, the notification will also include the conclusions of the preliminary archeological review regarding

[116] Note that the tribal notification requirements under Mitigation Measure M-TCR-1 are different than the notification requirements under Public Resources Code section 21080.3.1.

potential impacts to Native American archeological resources, and measures proposed to address archeological impacts, as described in Section E.4, Cultural Resources.

Consultation. Tribal representatives who request consultation shall be afforded the opportunity to provide input on potential impacts to tribal cultural resources and measures to mitigate such impacts. The aim of consultation is to ensure that tribal representatives are afforded the opportunity to provide meaningful input into project design, to provide input into the treatment of archeological tribal cultural resources, and to appropriately acknowledge and reflect tribal cultural heritage and values in the design and siting of open space elements, plantings, and interpretive materials.

For subsequent projects affecting Native American archeological resources, the consultation shall afford tribal representatives who respond to the notification the opportunity to provide input on potential impacts to Native American archeological resources that are tribal cultural resources, and measures to mitigate archeological impacts, including Mitigation Measures M-CR-2a, Procedures for Accidental Discovery of Archeological Resources for Projects Involving Soil Disturbance; M-CR-2b, Archeological Monitoring; M-CR-2c, Archeological Testing; and/or M-CR-2d, Treatment of Submerged and Deeply Buried Resources, as determined applicable by the ERO as described in Section E.4. These measures in regard to archeological tribal cultural resources require that tribal representative be afforded the opportunity to consult on development of archeological investigation plans, to participate in implementation of such plans as they relate to tribal cultural resources, and to recommend that cultural resources awareness training programs for construction workers include Native American tribal representatives and specific training on the treatment of Native American archeological and tribal cultural resources, if requested. These measures also identify preservation in place, if feasible as determined by the ERO, as the preferred treatment of resources that are known or are discovered during archeological investigations or during construction and require that tribal representatives be offered the opportunity to consult on preservation in place determinations and plans, if requested. In addition, these measures require that tribal representatives be offered meaningful opportunities to participate in the development of public interpretive materials that address Native American archeological and tribal cultural resources, and that these materials include acknowledgement that the project is located on traditional Ohlone lands.

For subsequent projects as described above, the consultation shall address potential non-archeological project impacts, with the objective of incorporating feasible site design and other measures into the project consistent with Waterfront Plan policies that, based on consultation, would reduce or eliminate these impacts. Feasible site design and other measures will be included in required BCDC and Waterfront Design Advisory Committee review processes to ensure all public access and design features and improvements are cohesive and consistent with waterfront urban design policies in Port and BCDC plans.

Site-specific measures that may be identified through consultation and are determined feasible by the ERO and the Port would be implemented by the Port or project sponsor in coordination with planning department staff. These could include, but would not be limited to:

- For subsequent projects that require pile-driving or deep foundations that extend to buried soils sensitive for Native American occupation, sampling and paleoenvironmental analysis of soils that would be affected by project piles or excavation to evaluate changes to the Native American environmental setting over the 8,000-year period of their occupation of San Francisco. Data

obtained through paleoenvironmental analysis may be included in interpretive exhibits, including native plantings as part of subsequent projects.

- Planting and vegetation treatments in publicly accessible open spaces and community gathering areas that emphasize native and/or environmentally sustainable shoreline plants, such as those traditionally gathered and used by the Ohlone.
- Public interpretive exhibits, coordinated with other Port interpretive programs, subject to public review by BCDC and Waterfront Design Advisory Committee review processes, that educate the public about and/or reflect tribal cultural heritage and values and address local Native American experience and history. Such interpretation program components should be coordinated with other interpretative programs along the waterfront, to maximize and enhance the value of each interpretive effort.
- Public art by local Native American artists.
- Public access areas or ensured access to an on-site space within the subsequent project site (such as a community room) that can be made available for gathering events organized by the local Native American community, by arrangement with event space organizers.
- Other educational tools and applications identified by tribal representatives.

Different or additional project-specific mitigation measures may be identified through Native American consultation if, in consultation between the tribal representative and the ERO, they are determined to be equally as or more effective than the measures identified above in mitigating the specific impact of proposed subsequent projects upon tribal cultural resources.

Project-specific mitigation measures applicable to the subsequent project shall be adopted by mutual agreement between the tribal consultants and the department and shall be implemented by the Port/project sponsor. Measures would be implemented during project design, construction, and operations as relevant to ensure that impacts to the values associated with tribal cultural resources are avoided or minimized, as determined feasible by the ERO.

The consultation process will determine whether subsequent projects would have impacts on the tribal cultural resource and, if so, the extent of impacts and feasible measures to mitigate the impacts. The ERO, Port, and project sponsor shall work with the tribal representatives to develop the scope, timeline, and method of delivery as determined by the ERO. Tribal representatives who engage in preparation or review of plans and documents shall be compensated for their work to fulfill their role in carrying out the mitigation requirements as determined through the scoping process described above.

If no tribal group requests consultation, but the ERO nonetheless determines that the proposed project may have a potential significant adverse effect on a tribal cultural resource based on prior consultation, the ERO may require implementation of the site-specific measures and treatments listed above, as applicable.

Under this measure, the department would notify Native American representatives, during project-level environmental review, of each of the types of proposed subsequent projects listed above. Notification would provide tribal representatives with the opportunity to consult and provide input on whether a tribal cultural resource is present at the project site, and on whether the subsequent project as proposed would diminish

the cultural value of that tribal cultural resource. Consultation, under Mitigation Measure M-TCR-1, would provide opportunities for tribes to propose measures, consistent with Waterfront Plan policies, goals and objectives, to reduce or avoid substantial adverse changes to tribal cultural resources, which shall be incorporated in the subsequent development to reduce the significant impact on non-archeological tribal cultural resources. Implementation of Mitigation Measure M-TCR-1, therefore, would reduce the potential of significant impact to shoreline tribal cultural resources from subsequent shoreline projects to a less-than-significant level.

In addition, for subsequent projects for which preliminary archeological review identifies potential impacts to archeological tribal cultural resources, tribal representative would be offered the opportunity to participate in planning and implementation of archeological monitoring, testing and/or data recovery efforts in regard to treatment of tribal cultural resources. If an archeological tribal cultural resource were identified during archeological monitoring or testing, or during construction, it would be preserved in place, if feasible as determined by the ERO. If that were deemed infeasible in consultation with tribal representatives, archeological data recovery (consistent with Mitigation Measures M-CR-2a, M-CR2-b, M-CR-2c, and/or M-CR-2d, as determined applicable by the ERO) would be implemented, followed by implementation of a public interpretation/land acknowledgement program developed in consultation with tribal representatives. Additional measures to be implemented for the treatment of either archeological or non-archeological tribal cultural resources to reduce or avoid significant impacts to these resources may be developed through Native American consultation, if requested, or as identified by the ERO, as required under Mitigation Measure M-TCR-1.

With implementation of these measures, the significant impacts on tribal cultural resources that could occur from subsequent development under the Waterfront Plan EIR would be ***less than significant with mitigation***.

Impact C-TCR-1: Development under the Waterfront Plan, in combination with cumulative projects, could result in a significant cumulative impact on tribal cultural resources. ***(Less than Significant with Mitigation)***

The Waterfront Plan area is sensitive for the presence of submerged and deeply buried archeological resources of Native American origin and is also sensitive for the presence of non-archeological tribal cultural resources, based on the tribal cultural value placed on the bay shoreline. Port property is part of the larger City of San Francisco geography that is sensitive for the presence of Native American resources, as described above. The cumulative geographic context for archeological and non-archeological tribal cultural resources includes urban development projects and transportation and streetscape improvements occurring within and surrounding the Waterfront Plan area. These could entail ground-disturbing activities and could result in impacts to archeological tribal cultural resources. In addition, impacts on non-archeological resources of the shoreline could occur if Waterfront Plan policies are not sensitively implemented by reducing the availability of access to the shoreline or areas that might sustain native shoreline vegetation, destruction of paleoenvironmental data, or by failing to appropriately incorporate tribal values in shoreline interpretive projects. The cumulative projects within and surrounding the Waterfront Plan area include development and infrastructure projects that propose new buildings, as well as streetscape and street network improvements and interpretive programs. (See Table 31, Cumulative Projects within a 0.25-Mile Radius of the Proposed Project, p. 37, for a list of cumulative projects considered in this analysis.) These cumulative projects, combined with subsequent projects and programs that could occur pursuant to the Waterfront Plan, have the potential to alter tribal cultural resources through development of sites and associated excavation activities

that could adversely affect archeological sites or reduce or eliminate characteristics and qualities of the shoreline that are culturally valued by the tribes. Therefore, the cumulative impact is considered significant.

Without mitigation, the Waterfront Plan, when combined with the cumulative projects within and surrounding the Plan area, has the potential to contribute considerably to the overall significant cumulative impact on tribal cultural resources. Implementation of Mitigation Measure M-TCR-1, in combination with Mitigation Measures M-CR-2a, M-CR-2b, M-CR-2c, and/or M-CR-2d, as determined applicable by the ERO as outline in Section E.4 for archeological tribal cultural resources, would ensure that subsequent projects and programs developed under the Waterfront Plan would not make a cumulatively considerable contribution to a significant cumulative impact on tribal cultural resources. Therefore, the impact would be ***less than significant with mitigation***.

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6. Transportation and Circulation

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
6. TRANSPORTATION AND CIRCULATION. Would the project:					
a) Involve construction that would require a substantially extended duration or intensive activity, the effects of which would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit?	☒	☐	☐	☐	☐
b) Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations?	☒	☐	☐	☐	☐
c) Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access?	☒	☐	☐	☐	☐
d) Substantially delay public transit?	☒	☐	☐	☐	☐
e) Cause substantial additional vehicle miles traveled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network?	☒	☐	☐	☐	☐
f) Result in a loading deficit, the secondary effects of which would create potentially hazardous conditions for people walking, bicycling, or driving; or substantially delay public transit?	☒	☐	☐	☐	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
g) Result in a substantial vehicular parking deficit, the secondary effects of which would create potentially hazardous conditions for people walking, bicycling, or driving; or interfere with accessibility for people walking or bicycling or inadequate access for emergency vehicles; or substantially delay public transit?	☒	☐	☐	☐	☐

Implementation of the Waterfront Plan could have the potential to result in significant impacts related to Transportation and Circulation; therefore, this topic is further analyzed in Draft EIR Section 4.C, Transportation and Circulation.

7. Noise

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
7. NOISE. Would the project result in:					
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 area, or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☒	☐	☐	☐	☐

Implementation of the Waterfront Plan could have the potential to result in significant impacts related to Noise; therefore, this topic is further analyzed in Draft EIR Section 4.D, Noise.

8. Air Quality

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
8. AIR QUALITY. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional 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?	☒	☐	☐	☐	☐

Implementation of the Waterfront Plan could have the potential to result in significant impacts related to Air Quality; therefore, this topic is further analyzed in Draft EIR Section 4.E, Air Quality.

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9. Greenhouse Gas Emissions

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
9. GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

Gases that trap heat in the atmosphere are referred to as greenhouse gases (GHGs) because they capture heat radiated from the sun as it is reflected back into the atmosphere. The accumulation of GHGs contributes to global climate change. The primary GHGs, or climate pollutants, are carbon dioxide, black carbon, methane, nitrous oxide, ozone, and water vapor.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during demolition, construction, and operation. Although the presence of some of the primary GHGs in the atmosphere is naturally occurring, carbon dioxide, methane, and nitrous oxide are also emitted from human activities, accelerating the rate at which these compounds occur within Earth's atmosphere. Emissions of carbon dioxide are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Black carbon has emerged as a major contributor to global climate change, possibly second only to carbon dioxide. Black carbon is produced naturally and by human activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass materials.[117] Nitrous oxide is a by-product of various industrial processes. Other GHGs, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are generated in certain industrial processes. GHGs are typically reported in "carbon-dioxide-equivalent" measures.[118]

Human influence on the climate system is now an established fact; combined evidence from across the climate system strengthens this finding. It is unequivocal that the increase of CO_2, methane (CH_4) and nitrous oxide (N_2O) in the atmosphere over the industrial era is the result of human activities and that human influence is the principal driver of many changes observed across the atmosphere, ocean, cryosphere and biosphere.[119] Secondary effects of climate change very likely include impacts on agriculture, the state's electricity system, and the ecosystems of native freshwater fish; an increase in the vulnerability of levees, such as in the Sacramento-San Joaquin Delta; changes in disease vectors; and changes in habitats and biodiversity.[120,121]

EXISTING GREENHOUSE GAS EMISSION ESTIMATES

The California Air Resources Board (air board) estimated that, in 2019, California produced about 418 million gross metric tons of carbon dioxide equivalents (MMT CO_2e).[122] The air board found that transportation is the source of 40 percent of the state's GHG emissions, followed by industrial uses, at 21 percent, and electricity generation (both in-state and outside generation), at 14 percent. Commercial and residential fuel use (primarily for heating) accounted for 10 percent of GHG emissions.[123] In San Francisco, motorized transportation and buildings (i.e., natural gas and electricity use within the buildings) were the two largest sources of GHG emissions, accounting for 47 percent (approximately 2.2 MMT CO_2e) and 41 percent (1.9 MMT CO_2e), respectively, of the approximately 4.6 MMT CO_2e emitted in San Francisco in 2019.[124] Other sources include landfilled organics (approximately 7 percent), municipal emissions (approximately 3 percent, including both municipal buildings and fleets), and agriculture (approximately 1.8 percent).[125]

Electricity in San Francisco is provided primarily by the San Francisco Public Utilities Commission (SFPUC) and Pacific Gas and Electric (PG&E). In 2019, electricity consumption in San Francisco totaled approximately

[117] Center for Climate and Energy Solutions, *What Is Black Carbon?* April 2010, https://www.c2es.org/document/what-is-black-carbon/, accessed September 30, 2021.
[118] Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide equivalents," which present a weighted average, based on each gas's heat absorption (or "global warming") potential.
[119] Intergovernmental Panel on Climate Change, *Technical Summary for AR6 Climate Change 2021: The Physical Science Basis, Working Group I Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 2021, https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf, accessed September 30, 2021.
[120] Ibid.
[121] California Climate Change Center, *Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California*, 2012, https://ucanr.edu/sites/Jackson_Lab/files/155618.pdf, accessed September 30, 2021.
[122] California Air Resources Board, *California Greenhouse Gas Inventory for 2000–2019 by Category as Defined in the Scoping Plan*, n.d., https://ww2.arb.ca.gov/ghg-inventory-data, accessed September 30, 2021.
[123] Ibid.
[124] San Francisco Department of the Environment, San Francisco's Carbon Footprint, n.d., https://sfenvironment.org/carbonfootprint, accessed September 30, 2021.
[125] Ibid.

5.6 million megawatt-hours.[126] The City produces approximately 80 percent of this power through Hetch Hetchy Power and CleanPowerSF, with the remaining energy coming from PG&E. CleanPowerSF was launched by SFPUC in 2016 to provide renewable energy to residents and businesses. The organization was formed to achieve the city's ambitious targets regarding the delivery of completely emissions-free electricity by 2030.[127] PG&E's 2019 power mix was as follows: 2 percent natural gas and other, 45 percent nuclear, 25 percent eligible renewables (described below), and 28 percent large hydroelectric.[128]

SFPUC, which operates three hydroelectric power plants as part of San Francisco's Hetch Hetchy water supply system, as well as solar, biomass, and biowaste infrastructure, provides electrical power to the San Francisco Municipal Railway, City buildings, and a limited number of commercial accounts in San Francisco.[129] Hetch Hetchy Power provides 100 percent greenhouse gas-free energy to public facilities.[130]

REGULATORY SETTING

STATE

Executive Orders S-3-05, B-30-15, and B-55-18. Executive Order S-3-05[131] sets forth a series of target dates by which time statewide emissions of GHGs will need to be progressively reduced, as follows: reduce emissions to 1990 levels by 2020 (approximately 427 MMT CO_2e) and 80 percent below 1990 levels by 2050 (approximately 85 MMT CO_2e). As discussed above, in 2019 California produced about 418 MMT CO_2e, meeting the 2020 GHG reduction target.[132]

Executive Order B-30-15 sets an interim statewide GHG emissions reduction target of 40 percent below 1990 levels by 2030. The purpose of this interim target is to ensure that California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050.[133] Executive Order B-30-15 also requires all state agencies with jurisdiction over sources of GHG emissions to implement measures within their statutory authority for achieving reductions in GHG emissions and meeting the 2030 and 2050 GHG emission reduction targets.

Executive Order B-55-18 establishes a statewide goal of achieving carbon neutrality as soon as possible, but no later than 2045, and achieving and maintaining net negative emissions thereafter. The air board was tasked

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[126] California Energy Commission, Electricity Consumption by County, 2019, https://ecdms.energy.ca.gov/elecbycounty.aspx, accessed September 30, 2021.
[127] Kevin Stark, Power Switch: S.F. Builds Case for Pushing Out PG&E, *San Francisco Public Press*, 2019, https://www.sfpublicpress.org/power-switch-s-f-builds-case-for-pushing-out-pge/, accessed September 30, 2021.
[128] Pacific Gas & Electric, Exploring Clean Energy Solutions, 2019, https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy, accessed September 30, 2021.
[129] San Francisco Public Utilities Commission, Hetch Hetchy Power System, https://sfpuc.org/about-us/our-systems/hetch-hetchy-power-system, accessed September 30, 2021.
[130] City of San Francisco Office of the Mayor, News Release Mayor London Breed Announces New Climate Commitments and Environmental Successes, April 22, 2021, https://sfmayor.org/article/mayor-london-breed-announces-new-climate-commitments-and-environmental-successes, accessed September 28, 2021.
[131] Office of the Governor, *Executive Order S-3-05*, June 1, 2005, http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf, accessed September 30, 2021. Executive Order S-3-05 sets forth a series of target dates by which statewide emissions of GHGs will need to be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 MMT CO_2e); by 2020, reduce GHG emissions to 1990 levels (approximately 427 MMT CO_2e); and by 2050, reduce GHG emissions to 80 percent below 1990 levels (approximately 85 MMT CO_2e). Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide equivalents," which present a weighted average, based on each gas's heat absorption (or "global warming") potential.
[132] California Air Resources Board, *California Greenhouse Gas Inventory for 2000–2019 by Category as Defined in the Scoping Plan*, n.d., https://ww2.arb.ca.gov/ghg-inventory-data, accessed September 30, 2021.
[133] Office of the Governor, *Executive Order B-30-15*, April 29, 2015, https://www.ca.gov/archive/gov39/2015/04/29/news18938/index.html, accessed September 30, 2021.

with developing a framework for implementing and accounting for progress toward the goal. Executive Order B-55-18 also requires all policies and programs undertaken to achieve carbon neutrality to be implemented in a manner that supports climate adaptation and biodiversity.[134]

Assembly Bill 32 and the Climate Change Scoping Plan. In 2006, the California Legislature passed Assembly Bill (AB) 32 (California Health and Safety Code division 25.5, section 38500 et seq.), also known as the California Global Warming Solutions Act. AB 32 requires the air board to design and implement emission limits, regulations, and other measures so that statewide GHG emissions are reduced to 1990 levels by 2020.

Pursuant to AB 32, the air board adopted the 2008 Climate Change Scoping Plan, which outlines measures to meet the 2020 GHG reduction limits. To meet the goals of AB 32, California needed to reduce its GHG emissions to 30 percent below projected 2020 business-as-usual emissions levels (approximately 15 percent below 2008 levels).[135] In 2018, the air board announced that inventory year 2016 emissions had dropped below 1990 levels, which is an achievement of the AB 32 goal as emissions have continued this current trajectory.[136]

The Climate Change Scoping Plan must be updated every five years to evaluate AB 32 policies and ensure that California is on track with respect to achieving long-term climate stabilization goals. The First Scoping Plan Update was approved in 2014, and an additional update was approved in 2017. The *2017 Climate Change Scoping Plan* identifies specific measures to reduce GHG emissions to 1990 levels by 2020, and requires the air board and other State agencies to develop and enforce regulations and other initiatives for reducing GHGs.[137] The plan identifies opportunities for leveraging and new funds that will drive GHG emissions reductions even farther through strategic planning and targeted low-carbon investments. The 2017 update defines the air board's climate change priorities for the next five years and sets the groundwork for reaching the long-term goals set forth in Executive Order B-30-15 and Senate Bill (SB) 32. The plan also highlights California's progress toward meeting the 2030 GHG emissions reduction goals of SB 32 and evaluates how to align the state's longer-term GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[138]

Specifically, the *2017 Climate Change Scoping Plan* articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the State. The Climate Change Scoping Plan anticipates that actions by local governments will reduce GHG emissions because local governments have primary authority to plan, zone, approve, and permit development that will accommodate population growth and the changing needs of their jurisdictions.[139] The plan also relies on the requirements of SB 375 (discussed below) to align local land use and transportation planning and achieve GHG reductions.

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[134] Office of the Governor, *Executive Order B-55-18*, September 10, 2018, https://www.ca.gov/archive/gov39/wp-content/uploads/2018/09/9.10.18-Executive-Order.pdf, accessed September 30, 2021.
[135] California Air Resources Board, AB 32 Global Warming Solutions Act of 2006, https://ww2.arb.ca.gov/resources/fact-sheets/ab-32-global-warming-solutions-act-2006, accessed September 30, 2021.
[136] California Air Resources Board, Climate pollutants fall below 1990 levels for the first time, 2018, https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time, September 30, 2021.
[137] California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf?utm_medium=email&utm_source=govdelivery, accessed September 30, 2021.
[138] Ibid.
[139] Ibid.

The next update, the 2022 Scoping Plan Update, will assess progress towards achieving the SB 32 2030 target (discussed below) and lay out a path to achieve carbon neutrality by mid-century pursuant to Executive Order B-55-18.[140]

Senate Bill 32 and Assembly Bill 197. On August 24, 2016, the California Legislature passed SB 32 (California Health and Safety Code division 25.5, section 38566), thereby amending the California Global Warming Solutions Act of 2006. SB 32 directed the air board to adopt, to the extent technologically feasible and cost effective, the rules and regulations necessary to achieve a reduction in statewide GHG emissions (i.e., to 40 percent below 1990 levels by 2030). The passage of SB 32 codified the 2030 interim GHG emissions reduction target established by Executive Order B-30-15.

SB 32 was paired with AB 197 (California Government Code division 2 of title 2, article 7.6 of chapter 1.5, California Health and Safety Code sections 39510, 39607, 38506, 38531, and 38562.5). AB 197 provides additional guidance on how to achieve the reduction targets established in Executive Order B-30-15 and SB 32. SB 32 and AB 197 became effective January 1, 2017.

The *2017 Climate Change Scoping Plan* estimates 385 MMT CO_2e will be reduced from known commitments, leaving a gap of 236 MMT CO_2e that is needed to meet the 2030 target codified by SB 32. The air board concluded that the gap in emissions will need to be bridged by the Cap-and-Trade program's achievement of 236 MMT CO_2e. **Table 1** shows the reductions that the air board is expecting from the known commitments of the scoping plan and the amount needed from the Cap-and-Trade program to achieve the 2030 target.[141]

Table 1 Cumulative GHG Reductions from the 2017 Scoping Plan Measures[142]

Scoping Plan Measure	GHG Reductions (million metric tons of carbon dioxide equivalents)
Short-Lived Climate Pollutants	217
Mobile Sources Clean Fuels and Technology and Freight	64
Landfill Methane Energy Efficiency	64
Biofuels	25
50% Renewable Portfolio Standards	16
Cap-and-Trade Program	236
Total Scoping Plan Reductions to meet SB 32 Target	**621**

SOURCE: California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, November 2017, https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf, accessed September 3, 2021.

Senate Bills 375 and 743. The Climate Change Scoping Plan relies on the requirements of SB 375 (chapter 728, statutes of 2008), also known as the Sustainable Communities and Climate Protection Act of 2008, to reduce carbon emissions from land use decisions. SB 375 requires regional transportation plans developed by each of

[140] California Air Resources Board, *Presentation 2022 Scoping Plan Update Scenario Concepts Technical Workshop*, August 17, 2021, https://ww2.arb.ca.gov/sites/default/files/2021-08/carb_presentation_sp_scenarioconcepts_august2021_0.pdf, accessed September 30, 2021.
[141] Ibid.
[142] California Air Resources Board, *California's 2017 Climate Change Scoping Plan*, https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf?utm_medium=email&utm_source=govdelivery, accessed September 30, 2021.

the state's 18 metropolitan planning organizations to incorporate a sustainable communities strategy in each regional transportation plan, which will then achieve the GHG emissions reduction targets set by the air board. Plan Bay Area 2050, prepared by the ABAG and MTC, is the official regional long-range plan to improve housing, the economy, transportation, and the environment across the bay area's nine counties — Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. Under Plan Bay Area 2050's strategies, just under half of all bay area households would live within 0.5 mile of frequent transit by 2050, with this share increasing to over 70 percent for households with low incomes. Transportation and environmental strategies that support active and shared modes, combined with a transit-supportive land use pattern, are forecasted to lower the share of bay area residents that drive to work alone from 50 percent in 2015 to 33 percent in 2050. Plan Bay Area 2050 forecasts that GHG emissions from transportation would decrease significantly as a result of these transportation and land use changes, and the bay area would meet the state mandate of a 19 percent reduction in per capita emissions by 2035—but only if all strategies are implemented.[143]

The Governor's Office of Planning and Research (OPR) implemented changes to the CEQA Guidelines, in accordance with SB 743, including the addition of section 15064.3, which requires CEQA transportation analyses to move away from a focus on vehicle delay and level of service. In support of these changes, OPR published its *Technical Advisory on Evaluating Transportation Impacts in CEQA*, which states that the determination of a project's transportation impact should be based on whether project-related vehicle miles traveled (VMT) per capita (or VMT per employee) would be 15 percent lower than that of existing development in the region.[144] OPR's technical advisory explains that this criterion is consistent with Public Resources Code section 21099, which states that the criteria for determining significance must "promote a reduction in greenhouse gas emissions." In addition, the 15 percent reduction is consistent with the VMT reduction that the air board has determined to be necessary to meet the state's 2030 and 2050 GHG goals.[145] This metric is intended to replace the use of vehicle delay and level of service for measuring transportation-related impacts.

Senate Bills 1078, 107, X1-2,350, and 100 and Executive Orders S-14-08 and S-21-09. California established aggressive renewable portfolio standards under SB 1078 (chapter 516, statutes of 2002) and SB 107 (chapter 464, statutes of 2006), which required retail sellers of electricity to provide at least 20 percent of their electricity from renewable sources by 2010. Executive Order S-14-08 (November 2008) expanded the state's renewable portfolio standards, which call for 20 to 33 percent of electricity to come from renewable sources by 2020. In 2009, Governor Schwarzenegger continued California's commitment to renewable portfolio standards by signing Executive Order S-21-09, which directed the air board to enact regulations to help California meet the renewable portfolio standards (i.e., 33 percent of electricity from renewable energy by 2020).[146]

In April 2011, Governor Brown signed SB X1-2 (chapter 1, statutes of 2011), codifying the GHG emissions reduction goal for energy suppliers (i.e., 33 percent of electricity from renewable energy by 2020). This renewable portfolio standard preempts the air board's standard that calls for 33 percent of electricity to come from renewable sources; it applies to all electricity suppliers (not only retail sellers) in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Under SB X1-2, all electricity-supplying entities must adopt the goals of the new renewable

[143] Association of Bay Area Governments and Metropolitan Transportation Commission, 2021, Plan Bay Area 2050, A Vision for the Future, Final, Released October 1, 2021, https://www.planbayarea.org/finalplan2050, accessed November 11, 2021.
[144] Governor's Office of Planning and Research, *Technical Advisory on Evaluating Transportation Impacts in CEQA,* December 2018, http://opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf, accessed September 30, 2021.
[145] Ibid.
[146] California Public Utilities Commission, Renewables Portfolio Standard (RPS) Program Overview, n.d., https://www.cpuc.ca.gov/rps/#:~:text=California%27s%20RPS%20program%20was%20established,a%2050%25%20RPS%20by%202030, accessed September 30, 2021.

portfolio standard (i.e., 20 percent of retail sales from renewable sources by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020).[147] Eligible renewable sources include geothermal, ocean wave, solar photovoltaic, and wind sources but exclude large hydroelectric facilities (30 megawatts or more). Therefore, because SFPUC receives more than 67 percent of its electricity from large hydroelectric facilities, the remaining electricity provided by SFPUC is required to be 100 percent renewable.[148] SB 350 (chapter 547, statutes of 2015), signed by Governor Brown in October 2015, dramatically increased the stringency of the renewable portfolio standard. SB 350 establishes a renewable portfolio standard that calls for 50 percent of electricity to come from renewable sources by 2030, along with interim targets of 40 percent by 2024 and 45 percent by 2027.

SB 100 further accelerates the renewable energy targets that were set by earlier legislation. The goal of the renewable portfolio standard was revised to achieve a 50 percent renewable resource target by the end of 2026 and 60 percent by the end of 2030. The bill states that it is the policy of the state for eligible renewable energy resources and zero-carbon resources to supply 100 percent of all retail sales of electricity to California end-uses, as well as 100 percent of the electricity procured for state agencies, by the end of 2045.[149]

Green Building Code and Title 24 Updates. The California Green Building Standards Code (CALGreen) (proposed Part 11, Title 24) was adopted as part of the California Building Standards Code (24 California Code of Regulations). Part 11 established voluntary standards that became mandatory under the 2010 edition of the code. These involved sustainable site development, energy efficiency (in excess of California Energy Code requirements), water conservation, material conservation, and internal air contaminants. The current energy efficiency standards were adopted in 2019 and took effect on January 1, 2020.

Executive Order S-01-07. With EO S-01-07, Governor Schwarzenegger set forth the low carbon fuel standard (LCFS) for California in 2007. Under this order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020. For 2020, the LCFS credit generation met 7.42 percent of the 7.5 percent target reduction while drawing down the cumulative credit bank to meet full compliance.[150]

Assembly Bill 1493. With the passage of AB 1493, also known as Pavley I, in 2002, California launched an innovative and proactive approach to dealing with GHG emissions and climate change at the State level. AB 1493 requires the air board to develop and implement regulations to reduce automobile and light-duty truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light-duty trucks beginning with the model year 2009. Although litigation challenged these regulations and the EPA initially denied California's related request for a waiver, the waiver request was granted.[151] Additional strengthening of the Pavley standards (referred to previously as *Pavley II* and now referred to as the *Advanced Clean Cars* measure) was adopted for vehicle model years 2017–2025 in 2012. Together, the two standards are expected to increase average fuel economy to roughly 54.5 miles per gallon (mpg) in 2025. The estimated standards for model year 2020 are 43.7 mpg for passenger cars and 31.3 mpg for light trucks.

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[147] Ibid.
[148] San Francisco Public Utilities Commission, Approval of the Enforcement Program for the California Renewable Energy Resources Act, December 13, 2011, https://www.gsweventcenter.com/Draft_SEIR_References/2011_1213_SFPUC_Agenda_Item_20.pdf, accessed November 9, 2021.
[149] Senator Kevin De Leon, *Senate Bill No. 100: California Renewable Portfolio Standards Program: Emissions of Greenhouse Gases*, September 10, 2018, https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB100, accessed September 30, 2021.
[150] California Air Resources Board, 2011-2020 Performance of the Low Carbon Fuel Standard, https://www.arb.ca.gov/fuels/lcfs/dashboard/dashboard.htm, accessed January 10, 2022.
[151] California's waiver to set state-specific standards is currently uncertain as a result of the SAFE Vehicles Rule.

Innovative Clean Transit. Adopted in December 2018, the Innovative Clean Transit regulation requires public transit agencies to gradually transition to 100 percent zero-emissions bus fleets by 2040. According to the air board, this regulation will provide the following benefits to the state:[152]

- Reduce GHG emissions for all Californians, especially transit-dependent and disadvantaged communities. The majority of these benefits will be in the state's most populated and impacted areas where transit buses are most prevalent.
- Increase penetration of the first wave of zero-emissions heavy-duty technologies into applications that are well suited to their use to further achieve emissions reduction benefits.
- Save energy and reduce dependency on petroleum and other fossil fuels.
- Expand zero-emissions-vehicles industry to bring high-quality green jobs to local communities and trained workforce to California.
- Provide other societal benefits by encouraging improved mobility and connectivity with zero-emissions transportation modes and reduced growth in light-duty vehicle miles traveled.

Short-Lived Climate Pollutant Reduction Strategy. SB 605 directed the air board, in coordination with other State agencies and local air districts, to develop a comprehensive short-lived climate pollutant (SLCP) Reduction Strategy, while SB 1383 directed the air board to approve and implement the SLCP Reduction Strategy to achieve the following reductions in SLCPs:

- 40 percent reduction in CH_4 below 2013 levels by 2030
- 40 percent reduction in hydrofluorocarbon (HFC) gases below 2013 levels by 2030
- 50 percent reduction in anthropogenic black carbon below 2013 levels by 2030

The bill also establishes the following targets for reducing organic waste in landfills and CH_4 emissions from dairy and livestock operations as follows:

- 50 percent reduction in organic waste disposal from the 2014 level by 2020
- 75 percent reduction in organic waste disposal from the 2014 level by 2025
- 40 percent reduction in CH_4 emissions from livestock manure management operations and dairy manure management operations below the dairy sector's and livestock sector's 2013 levels by 2030

The air board and California's Department of Resources Recycling and Recovery (CalRecycle) are currently developing regulations to achieve the organic waste reduction goals under SB 1383. In January 2019 and June 2019, CalRecycle proposed new and amended regulations in California Code of Regulations titles 14 and 27. Among other things, the regulations set forth minimum standards for organic waste collection, hauling, and composting. The final regulations will take effect on or after January 1, 2022.

The air board adopted the short-lived climate pollutant (SLCP) Reduction Strategy in March 2017 as a framework for achieving the CH_4, HFC, and anthropogenic black carbon reduction targets set by SB 1383. The SLCP Reduction Strategy includes 10 measures to reduce SLCPs, which fit within a wide range of ongoing

[152] California Air Resources Board, Innovative Clean Transit, https://ww2.arb.ca.gov/our-work/programs/innovative-clean-transit/about, September 3, 2021.

planning efforts throughout the State, including the air board's and CalRecycle's proposed rulemaking on organic waste diversion.

REGIONAL

The Bay Area Air Quality Management District (air district) is responsible for attaining and maintaining federal and state air quality standards in the San Francisco Bay Area Air Basin, as established by the federal Clean Air Act and the California Clean Air Act. The acts require plans to be developed for areas that do not meet air quality standards. The most recent air quality plan, the Bay Area 2017 Clean Air Plan, includes a goal that calls for reducing GHG emissions to 1990 levels by 2020, 40 percent below 1990 levels by 2035, and 80 percent below 1990 levels by 2050.[153] In addition, the air district established a climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the air basin. The program includes GHG emissions reduction measures that promote energy efficiency, reduce VMT, and help with the development of alternative energy sources.[154]

The air district's CEQA Air Quality Guidelines help lead agencies comply with the requirements of CEQA with respect to potentially adverse impacts on air quality. The air district advises lead agencies to consider adopting a GHG emissions reduction strategy that meets climate stabilization goals and then review projects for compliance with the GHG emissions reduction strategy as a CEQA threshold of significance.[155] This is consistent with the approach to analyzing GHG emissions described in CEQA Guidelines section 15183.5.

LOCAL

San Francisco Greenhouse Gas Reduction Ordinance. In May 2008, the City adopted ordinance 81-08, amending the San Francisco Environment Code to establish GHG emissions targets and require departmental action plans. Ordinance 81-08 authorized the San Francisco Department of the Environment to coordinate efforts to meet the targets and established the following GHG emissions reduction limits and target dates:

- Determine 1990 citywide GHG emissions by 2008 (i.e., the baseline level, with reference to which target reductions have been set).
- Reduce GHG emissions to 25 percent below 1990 levels by 2017.
- Reduce GHG emissions to 40 percent below 1990 levels by 2025.
- Reduce GHG emissions to 80 percent below 1990 levels by 2050.[156]

In July 2021, the City adopted an updated GHG ordinance to demonstrate the city's commitment to the Paris Agreement by establishing GHG reduction targets for 2030, 2040, and 2050 and setting other critical sustainability goals. The updated ordinance sets goals for both sector-based emissions and consumption-based emissions. The GHG targets established under ordinance 81-08 applied solely to sector-based emissions, which are those emissions that are generated within the geographic boundaries of the city. The updated ordinance reflects a more comprehensive effort to reduce GHG emissions by setting consumption-based

[153] Bay Area Air Quality Management District, *2017 Clean Air Plan*, April 2017, https://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf, accessed September 30, 2021.
[154] Bay Area Air Quality Management District, Climate Protection Planning Program, 2017, https://www.baaqmd.gov/plans-and-climate/climate-protection/climate-protection-program, accessed September 30, 2021.
[155] Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines*, May 2017, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, accessed September 30, 2021.
[156] City and County of San Francisco, Greenhouse Gas Emissions Targets and Departmental Action Plans, May 13, 2008, https://sfenvironment.org/policy/chapter-9-greenhouse-gas-emissions-targets-and-departmental-action-plans, accessed September 30, 2021.

targets as well. Consumption-based emissions are those that are associated with producing, transporting, using, and disposing of products and services consumed by people within the city, even those emissions that are generated outside of the city boundaries. The City's updated GHG reduction targets are as follows:

- By 2030, reduce sector-based GHG emissions to 61 percent below 1990 levels.
- By 2030, reduce consumption-based GHG emissions to 30 metric tons (MT) CO_2e per household or less, equivalent to a 40 percent reduction compared to 1990 levels.
- By 2040, reach net-zero sector-based emissions and sequester any residual emissions using nature-based solutions.[157]
- By 2050, reduce consumption-based GHG emissions to 10 MT CO_2e per household or less, equivalent to an 80 percent reduction compared to 1990 levels.

These sector-based GHG reduction targets are more ambitious than those set forth in Governor Brown's Executive Order B-30-15 (e.g., a 61 percent reduction in sector-based GHG emissions by 2030 rather than a 40 percent reduction by 2030) and in B-55-18 (e.g., achieving carbon neutrality by 2040 rather than by 2045). The consumption-based targets are consistent with the 2030 goal of Executive Order B-30-15 and the 2050 goal of Executive Order S-3-05 (80 percent below 1990 levels, by 2050).

The updated GHG ordinance also serves to codify the city's "0-80-100-Roots" climate action framework, which comprises climate and sustainability goals in these key areas: waste, transportation, energy, and carbon sequestration. The framework also emphasizes the importance of housing in implementing meaningful climate solutions, which require an increased supply of high-quality housing that is both affordable and near transit service. The goals in the 0-80-100-Roots framework are defined as follows:

- Zero Waste (**0**-80-100-Roots)
  - By 2030, reduce the generation of solid waste to 15 percent below 2015 levels and reduce the amount of solid waste that is incinerated or sent to landfill to at least 50 percent below 2015 levels.
- Transportation (0-**80**-100-Roots)
  - By 2030, increase the percentage of low-carbon trips to at least 80 percent of measured trips and increase the number of electric vehicles to at least 25 percent of all registered private vehicles.
  - By 2045, increase the number of electric vehicles to 100 percent of all registered private vehicles.
- Energy (0-80-**100**-Roots)
  - By 2025, supply 100 percent renewable electricity.
  - By 2045, supply 100 percent renewable energy.
- Carbon Sequestration (0-80-100-**Roots**)
  - Sequester carbon through ecosystem restoration, including an increased urban tree canopy (i.e., tree roots), green infrastructure, and compost applications.

[157] Nature-based solutions are those that remove remaining emissions from the atmosphere by storing them in natural systems that support soil fertility or employing other carbon farming practices.

- Housing and Buildings
  - Build at least 5,000 new housing units per year, with at least 30 percent of these units provided as affordable units.
  - By 2021, require zero onsite fossil fuel emissions from all new buildings.
  - By 2035, require zero onsite fossil fuel emissions from all large existing commercial buildings.

To support the 2021 Housing and Buildings goal of zero onsite fossil fuel emissions from all new buildings, the Board of Supervisors passed an all-electric new construction ordinance in November 2020. Taking effect on June 1, 2021, the ordinance, which applies to all new buildings, prohibits the construction of natural gas or propane infrastructure.[158]

Greenhouse Gas Reduction Strategy Update. San Francisco has developed many plans and programs for reducing the city's contribution to global climate change and meeting the goals of ordinance 81-08. The Greenhouse Gas Reduction Strategy Update[159] documents city actions related to pursuing cleaner energy, reducing energy consumption, supporting alternative transportation, and implementing solid waste policies, all of which reduce GHG emissions. For instance, the city has implemented mandatory requirements and incentives that have measurably reduced GHG emissions, including, but not limited to, requirements for increased energy efficiency in new and existing buildings, requirements for solar and/or living roofs on most new construction, implementation of a green building strategy, implementation of a transportation sustainability program, adoption of a zero-waste strategy, adoption of a construction and demolition debris recovery ordinance, creation of a solar energy generation subsidy, incorporation of alternative-fuel vehicles in the city's transportation fleet (including buses), and adoption of a mandatory recycling and composting ordinance. The strategy also includes specific regulations for new development, which would reduce GHG emissions generated by anticipated future development. These GHG emissions reduction actions resulted in a 41 percent reduction in GHG emissions in 2019 compared with 1990 levels[160] and exceeded the 2020 goals in the air district's 2017 Clean Air Plan, Executive Orders S-3-05 and B-30-15, AB 32, and the city's 2017 GHG emissions reduction goal. With this 41 percent reduction in GHG emissions, the City has met interim 2030 targets of 40 percent below 1990 levels, and has done so more than 10 years before the target date.

The July 2021 GHG ordinance requires the San Francisco Department of the Environment to prepare and submit to the Mayor a Climate Action Plan (CAP) by December 31, 2021. The CAP, which is to be updated every five years, will carry forward the efforts of the city's previous climate action plans and align with the Paris Agreement (e.g., limit global warming to 1.5 degrees Celsius) as well as the reduction targets adopted within the GHG ordinance. The CAP will also incorporate an equity framework to address historic inequities; prioritize the social, economic, and environmental benefits from implementing the CAP; and ensure that those benefits are distributed equitably. Other goals of the CAP include identifying synergies with the city's Hazards and Climate Resilience Plan and incorporating frameworks for health and vulnerable populations. Areas of focus in the CAP will include the following: energy supply, transportation and land use, building operations, housing,

[158] San Francisco Department of Building Inspection, All-Electric New Construction Ordinance, https://sfdbi.org/AllElectricNewConstructionOrdinance, accessed September 30, 2021.
[159] San Francisco Planning Department, Greenhouse Gas Reduction Strategy Update, July 2017, https://sfplanning.org/project/greenhouse-gas-reduction-strategies, accessed September 30, 2021.
[160] San Francisco Department of the Environment, San Francisco's Carbon Footprint, 2017, https://sfenvironment.org/carbonfootprint, accessed September 30, 2021.

responsible production and consumption, and carbon sequestration. Reduction targets, goals, and/or principles will be outlined for each of these elements.

APPROACH TO ANALYSIS

CEQA Guidelines section 15064.4 calls for a "good-faith effort" to "describe, calculate, or estimate" GHG emissions. CEQA Guidelines section 15064.4 also allows lead agencies to rely on a qualitative analysis to describe GHG emissions resulting from a project. In accordance with section 15064.4, the significance of GHG impacts should consider the extent to which the proposed action would increase or reduce GHG emissions, exceed a locally applicable threshold of significance, or comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions." The CEQA Guidelines also state that a project may be found to have a less-than-significant impact if it complies with an adopted plan that includes specific measures to reduce GHG emissions (section 15064(h)(3)). Similarly, the air district has prepared guidelines and methodologies for analyzing GHGs. These guidelines are consistent with CEQA Guidelines sections 15064.4 and 15183.5, which pertain to the analysis and determination of significant impacts from a proposed project's GHG emissions.[161]

With respect to GHG emissions, determination of the impacts of the Waterfront Plan is based on compliance with local, regional, and state plans, policies, and regulations adopted for the purpose of reducing the cumulative impacts of climate change. GHG emissions are analyzed in the context of their contribution to the cumulative effects of climate change because individual projects could never generate enough GHG emissions to result in a noticeable change in the global average temperature.

As discussed above, the Climate Change Scoping Plan adopted pursuant to SB 32 is the state's overarching plan for addressing climate change. Its recommendations are intended to curb projected business-as-usual increases in GHG emissions and reduce them to 40 percent below 1990 levels. As noted in the Regulatory Setting, other bills and executive orders have established reduction goals for future years (i.e., 2045 and 2050). Meeting the emissions targets of SB 32 as well as longer-term goals would result in an overall annual net decrease in GHG emissions compared with current levels and account for the projected increases in emissions resulting from anticipated growth.

In summary, applicable GHG reduction plans and regulations; Executive Orders S-3-05, B-30-15, and B-55-18; the Climate Change Scoping Plan and related updates; 2017 Clean Air Plan; Strategies to Address Greenhouse Gas Emissions in San Francisco; and updated San Francisco GHG ordinance are intended to reduce GHG emissions to below current levels. Given that the city's GHG emissions reduction targets are more aggressive than the state's 2030 and 2045 GHG emissions reduction targets, the city GHG ordinance is consistent with the goals of statewide executive orders and bills (i.e., AB 32, SB 32, and Executive Orders S-3-05, B-30-15, B-55-18). Therefore, projects that are consistent with the Strategies to Address Greenhouse Gas Emissions in San Francisco would be consistent with the state's GHG goals and would not conflict with an applicable plan or generate GHG emissions that would make a considerable contribution to global climate change. The air district has reviewed the GHG reduction strategy and concluded that "aggressive GHG reduction targets and comprehensive strategies like San Francisco's help the bay area move toward reaching the state's AB 32 goals and also serve as a model from which other communities can learn." Although the AB 32 milestone year of 2020 has passed, San Francisco's updated San Francisco GHG ordinance includes a pathway to reach the 2030

[161] The air district is currently updating its existing CEQA Guidelines and the Thresholds of Significance for GHGs. As detailed in the air district's December 9, 2021, public workshop on this update, the air district's proposed thresholds maintain the option to evaluate projects based upon consistency with a local GHG reduction strategy that meets the criteria under CEQA Guidelines section 15183.5(b).

goals of SB 32 to ensure that the city continues to serve as a model for other communities. As noted previously, GHG emissions reduction actions implemented by the City resulted in a 41 percent reduction in GHG emissions in 2019 compared with 1990 levels and exceeded the 2020 goals in the air district's 2017 Clean Air Plan, Executive Orders S-3-05 and B 30-15, AB 32, and the City's 2017 GHG emissions reduction goal. With this 41 percent reduction in GHG emissions, the City has met interim 2030 targets of 40 percent below 1990 levels, and has done so more than 10 years before the target date.

IMPACTS AND MITIGATION MEASURES

Impact C-GG-1: The Waterfront Plan would generate GHG emissions, but not at levels that would result in a significant impact on the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. ***(Less than Significant)***

The Waterfront Plan would not immediately result in GHG emissions. However, subsequent projects in the Plan area resulting from its implementation would result in GHG emissions. Direct operational emissions include GHG emissions from new vehicle trips.[162] Indirect emissions include emissions from electricity providers; emissions associated with the energy required to pump, treat, and convey water; emissions associated with waste removal and disposal as well as landfill operations; and construction-related GHGs.

The Port shares the City's Climate Action Plan goal of net-zero GHG emissions for Port-controlled operations by 2050.[163] Consequently, the Port analyzes GHG emissions-generating activities via the Port's most recent 2014 Climate Action Plan and recognizes transportation as a major source of carbon emissions. The Port currently uses renewable diesel in its trucks and heavy-duty vehicles and seeks to transform its fleet with each vehicle purchase, prioritizing electric or hybrid vehicles. The Port also generates solar power at multiple sites including Pier 15, Pier 1, Pier 96, Oracle Park, and the EcoCenter at Heron's Head Park, and pursues opportunities for additional solar power generation with new projects. The Port will continue to pursue low-carbon transportation alternatives and low emissions on-site energy generation pursuant to the Waterfront Plan, minimizing GHG emissions contributions. Additionally, Objective 2 for the Mission Bay subarea would seek to prioritize Pier 50 as a second cruise ship berth (instead of Pier 35) in part because the pier is equipped with shoreside power that can be upgraded to support cruise ships to plug into the City's zero-emission hydropower electrical grid, which would further reduce maritime GHG emissions in the Plan area.

The Environmental Sustainability goal is new in the Waterfront Plan and describes natural and environmental resources and management responsibilities along the waterfront, including the Port's regulatory compliance and environmental sustainability stewardship initiatives. The Port's environmental sustainability efforts involve managing activities and resources to protect air quality, water quality, public health, and biodiversity; and to limit the impact of climate change, improve the Bay ecology, and create healthy waterfront neighborhoods. The Waterfront Plan includes new policies aimed at reducing GHG emissions to minimize contribution to climate change. Environmental Sustainability Policy 1a directs the Port to minimize carbon and other greenhouse gas emissions and maximize carbon capture and sequestration by the Port and its tenants and development partners. Policy 1b directs the Port to consider incentives for carbon emissions reduction measures in Port leasing and development activities, above those already mandated by existing regulations (e.g., energy efficiency and use of cleaner fuels and technologies). Policy 1c directs the Port to

[162] Natural gas combustion would not likely be a direct source of emissions due to the all-electric building ordinance (San Francisco Department of Building Inspection 2021, All-Electric New Construction Ordinance, https://sfdbi.org/AllElectricNewConstructionOrdinance, accessed October 29, 2021). Some exceptions could apply that would necessitate natural gas usage (section 106A.1.17.1), such as areas specifically designated for occupancy by a commercial food service establishment, or where electricity use is physically or technologically infeasible, as stated in the code.
[163] Port of San Francisco, Sustainability, https://sfport.com/projects-programs/sustainability#tab-12825-pane-5, accessed February 22, 2022.

explore new funding and other opportunities to improve energy efficiency; generate and use solar, wind, or other renewable power; and facilitate use of alternative fuels, consistent with the City's 0-80-100-Roots policy. Policy 1d directs the Port to minimize transportation-based greenhouse gas emissions.

The Waterfront Plan demonstrates the Port's support of the City's Transit First Policy through objectives that incentivize alternative transportation modes and partnerships to expand public transit access. The Plan encourages the Port to work with SFMTA to develop a program of transportation improvement consistent with the City's GHG ordinance to shift 80 percent of trips to sustainable trips by 2030. In addition to transit and alternative mode investments and expansion, the Waterfront Plan's Maritime Policy 10 targets maritime GHG emissions by encouraging investment in environmentally sustainable shore power facilities for cruise ships that comply with California Air Resources Board regulations.

The Waterfront Plan also seeks to reduce vehicle trips, traffic congestion and address City climate goals through its parking and transportation demand management. The Plan would reduce parking demand and manage parking supply to incentivize alternative transportation. The Plan would discourage the development of net new automobile parking spaces, manage paid on-street parking to encourage parking turnover, limit the number of dedicated parking spaces in pier rehabilitation projects and prohibit residential permit parking among other actions to manage parking demand. The Waterfront Plan's parking management objectives aim to reduce single-occupant and automobile demand, thereby reducing automobile travel and congestion which contribute to GHG emissions. Accordingly, the Waterfront Plan would tailor new mixed-use development and major leasing projects to promote sustainable transportation modes to minimize single-occupant vehicle trips. The Waterfront Plan also would accommodate growth and transportation demand by locating high-density centers and new housing within the shortest walk to transit stops.

In summary, the Waterfront Plan would incentivize increased intensity of use. The increase in the number of users of the Waterfront Plan area would very likely increase foot, bicycle, and vehicular traffic, as well as overall energy and water usage. Therefore, the Waterfront Plan and subsequent projects resulting from implementation of the Waterfront Plan would contribute to annual long-term increases in GHG emissions as a result of increased vehicle trips (mobile sources) and residential and commercial operations that result in an increase in energy (i.e., electric power) use, water use, wastewater treatment, and solid waste disposal. However, as discussed above, the Plan includes several policies that would limit or reduce GHG emissions from activities within the Waterfront Plan area. Additionally, subsequent projects resulting from implementation of the Waterfront Plan would be required to comply with the applicable regulations and plans noted above. As such, the Waterfront Plan would be consistent with San Francisco's Greenhouse Gas Reduction Strategy and subsequent projects would be required to comply with regulations that have been proven effective at meeting the City's GHG reduction targets. The combination of all the City's actions, described in the GHG reduction strategy, have resulted in the City meeting its 2020 goals as well as the longer-term 2030 goals in SB 32. Therefore, the Waterfront Plan would result in a ***less-than-significant*** impact with respect to GHG emissions.

Mitigation: None required.

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10. Wind

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
10. WIND. Would the project:					
a) Create wind hazards in publicly accessible areas of substantial pedestrian use?	☐	☒	☐	☐	☐

ENVIRONMENTAL SETTING

Average wind speeds in the city are the highest in the summer and lowest in winter. However, the strongest peak wind speeds occur in winter (wind direction is also most variable in the winter). Wind speeds are diurnal and fluctuate throughout the day, with the highest average wind speeds occurring during the mid-afternoon and the lowest in the early morning. Based on over 40 years of recordkeeping at the old San Francisco Federal Building near Civic Center, the highest mean hourly wind speeds (approximately 20 miles per hour [mph]) occur in July, while the lowest mean hourly wind speeds (in the range of 6 mph to 9 mph) occur in November.

In the city, westerly to northwesterly winds are the most frequent and strongest winds during all seasons.[164] Of the 16 primary wind directions, five have the greatest frequency of occurrence: the northwest, west-northwest, west, west-southwest, and southwest.[165] Additionally, most of the measured winds over 13 mph—the speed at which pedestrians begin to feel discomfort—blow from these directions.

APPROACH TO ANALYSIS

Tall buildings and exposed structures can strongly affect the wind environment for pedestrians. A building that stands alone or is much taller than the surrounding buildings can intercept and redirect winds that might otherwise flow overhead and bring them down the vertical face of the building to ground level, where they create ground-level wind and turbulence (variability in wind speed and pressure).

For the purposes of CEQA review, the planning department has determined that an exceedance of the pedestrian wind hazard criterion set forth in the San Francisco Planning Code is the standard for determining whether a proposed development project would result in a significant wind impact. Planning code section 825(d), Reduction of Ground-Level Wind Currents, is applicable in the Rincon Hill and South Beach Downtown Residential Mixed-Use Districts. This section of the code is relevant to the analysis of wind impacts because wind analyses for other development projects in San Francisco indicates that buildings less than 85 feet tall typically do not result in substantial increases in ground-level winds that would exceed the hazard criterion. The only location within Port jurisdiction where the existing height limit is 85 feet or greater (other than sites of already approved or developed projects) is Seawall Lot 330, located west of The Embarcadero between Bryant and Beale streets within the South Beach subarea and within the South Beach Downtown Residential Use District; therefore, it is subject to planning code section 825(d). The height limit on Seawall Lot 330 is 105 feet.

[164] Wind directions are reported as directions from which the winds blow.
[165] The 16 primary wind directions, clockwise beginning with west winds, are west, west-northwest, northwest, north-northwest, north, north-northeast, northeast, east-northeast, east, east-southeast, southeast, south-southeast, south, south-southwest, southwest, and west-southwest.

Section 825(d) requires buildings to be shaped so as not to cause ground-level wind currents to exceed, more than 10 percent of the time, 11 mph in substantial pedestrian use areas, and 7 mph in public seating areas. When a project would result in exceedances of these criteria, an exception may be granted, pursuant to planning code section 309, if the building or addition cannot be designed to meet the criteria. Section 825(d) also establishes a hazard criterion, which is an equivalent wind speed of 26 mph as averaged for a single full hour of the year.[166] Under section 825(d), new buildings and additions may not cause wind speeds that meet or exceed this hazard criterion and no exception may be granted for buildings that result in winds that exceed the hazard criterion. Accordingly, the CEQA significance criterion for wind is whether a project would exceed 26 mph for a single hour of the year.

IMPACTS AND MITIGATION MEASURES

Impact WI-1: The Waterfront Plan could create wind hazards in publicly accessible areas of substantial pedestrian use. ***(Less than Significant with Mitigation)***

Previous wind analyses undertaken on properties within the Port's jurisdiction indicate that conditions along the 7.5-mile waterfront are generally windy. Wind tunnel testing for projects located both north and south of Seawall Lot 330 have identified existing exceedances of the pedestrian wind hazard criterion at locations including the east (bay) end of Pier 29 (a location exposed to strong northwest winds from the bay) to the north and at Seawall Lot 337 and Pier 70 to the south.[167,168,169] However, a 2001 wind analysis for a project that included Seawall Lot 330 found that, under then-existing conditions, there were no exceedances of the wind hazard criterion at Seawall Lot 330 or at Piers 30 and 32, across The Embarcadero.[170]

Most locations within the Waterfront Plan's five subareas are limited to 40-foot-tall buildings. Moreover, development that could occur pursuant to the Plan would occur on sites limited to 40-foot building heights, except for Seawall Lot 330 in the South Beach subarea, which has a maximum allowable height limit of 105 feet. Because buildings less than 85 feet tall typically do not result in substantial increases in ground-level winds, buildout of subsequent projects that could occur pursuant to the Waterfront Plan in areas where the maximum allowable building height limit is 40 feet would have a minimal, if any, effect on wind speeds in the area.

SEAWALL LOT 330

The analysis for Seawall Lot 330 is based on a prior wind analysis prepared in 2001 for the San Francisco Cruise Terminal Mixed-Use Project & Brannan Street Wharf Project.[171] The prior wind analysis evaluated a project that proposed two towers on The Embarcadero at heights of 130 feet and 105 feet, as well as a 17-story, 187-foot-tall residential tower on the west side of the parcel (this third tower was the only building constructed and is now referred to as the Watermark). Wind speeds were measured for existing conditions, existing conditions

[166] The wind hazard criterion is derived from the 26 mph hourly average wind speed that would generate a 3-second gust of wind at 20 meters per second, a commonly used guideline for wind safety. Because the original Federal Building wind data were collected at 1-minute averages, the 26 mph hourly average is converted to a 1-minute average of 36 mph, which is used to determine compliance with the 26 mph-hazard criterion in the planning code (Arens, E. et al., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, Vol. 24, No. 4, p. 297–303, 1989).

[167] San Francisco Planning Department, *The 34th America's Cup Races and James R. Herman Cruise Terminal and Northeast Wharf Plaza EIR*, Case No. 2010.0493E, p. 5.10-4; Final EIR certified December 15, 2011.

[168] San Francisco Planning Department, *Seawall 337 and Pier 48 Mixed-Use Project EIR*, Case No. 2013.0208E, p. 4.I-14; Final EIR certified October 5, 2017.

[169] San Francisco Planning Department, *Pier 70 Mixed-Use District Project EIR*, Case No. 2014-001272ENV, p. 4.I.38; Final EIR certified August 24, 2017.

[170] San Francisco Planning Department, *San Francisco Cruise Terminal and Brannan Street Wharf Project EIR*, Case No. 2000.1229E, pp. 145–146; Final EIR certified November 21, 2002.

[171] [171] San Francisco Planning Department, *San Francisco Cruise Terminal and Brannan Street Wharf Project EIR*, Case No. 2000.1229E; Final EIR certified November 21, 2002.

plus the project, and two other scenarios representing existing conditions plus two separate alternatives. The wind tunnel test found that localized wind conditions under the existing conditions in this area of the waterfront are moderately windy. As noted above, there were no exceedances of the wind hazard criterion under existing conditions. With implementation of the project, the wind analysis found that the average wind speed for all 59 test points would be just over 9 mph, a decrease of about 1 mph from the existing conditions. Regarding the hazard criterion, the wind analysis found that the project would not result in any exceedances of the hazard criterion.

Subsequent projects that could occur under the Plan at Seawall Lot 330 could reach the parcel's maximum allowable building height of 105 feet and could stretch the length of The Embarcadero between Bryant and Beale streets (approximately 630 feet). As stated above, prior wind tunnel testing of buildings up to 130 feet at this site did not result in any new exceedances of the wind hazard criterion. While local conditions in the immediate vicinity are similar to how they were in 2001 (with the exception of the now-existing Watermark), it is possible that development of a 105-foot building on Seawall Lot 330 could result in ground-level wind acceleration and possible exceedances of the wind hazard criterion. This is because wind effects are highly design-specific and a building with massing different from that analyzed in 2001 could perform differently in terms of its effects on pedestrian-level winds, compared to the project previously analyzed. If ground-level wind acceleration were to occur, it could result in potentially hazardous conditions for people walking along sidewalks in the vicinity of the development. For this reason, this impact would be potentially significant.

Because the Waterfront Plan would not immediately result in new development, building design details for subsequent projects have not been developed and cannot be known at this time. Therefore, the impacts that building design may have on pedestrian-level winds are not known. Implementation of **Mitigation Measures M-WI-1a, Wind Analysis and Minimization Measures for Subsequent Projects**, and **M-WI-1b, Maintenance Plan for Landscaping and Wind Baffling Measures in the Public Right-of-Way**, would reduce the potential for a net increase in wind hazard exceedances and the hours of wind hazard exceedances to a less-than-significant level.

> **Mitigation Measure M-WI-1a: Wind Analysis and Minimization Measures for Subsequent Projects.** All projects proposed within the Plan Area that would have a height greater than 85 feet shall be evaluated by a qualified wind expert, in consultation with the San Francisco Planning Department, to determine their potential to result in a new wind hazard exceedance or aggravate an existing wind hazard exceedance (defined as the one-hour wind hazard criterion with a 26 mph equivalent wind speed). If the qualified expert determines that wind-tunnel testing is required due to the potential for a new or worsened wind hazard exceedance, such testing shall be undertaken in coordination with San Francisco Planning Department staff, with results summarized in a wind tunnel report. The buildings tested in the wind tunnel shall incorporate only those wind baffling features that can be shown on plans. Such features must be tested in the wind tunnel and discussed in the wind tunnel report in the order of preference discussed below, with the overall intent being to reduce ground-level wind speeds in areas of substantial use by people walking (e.g., sidewalks, plazas, building entries, etc.):
>
> 1. *Building Massing.* New buildings and additions to existing buildings shall be shaped to minimize ground-level wind speeds. Examples of these include setbacks and/or podiums, stepped and/or curved facades, and vertical steps in the massing to help disrupt downwashing flows.
> 2. *Wind Baffling Measures on the Building and on the Project Sponsor's Private Property.* Wind baffling measures shall be included on future buildings and/or on the parcel(s) to disrupt vertical wind flows along tower façades and through the project site. Examples of these may include staggered

balcony arrangements on main tower façades, screens, canopies, and/or fins attached to the buildings, covered walkways, colonnades, large-scale art features, landscaping, free standing canopies, and/or wind screens. Solid windscreens have a greater effect at reducing the wind speeds to immediate leeward side of the screens; however, outside of this area of influence, the winds are either unaffected or accelerated. Porous windscreens have less of an impact to the immediate leeward side; however, they have an increased area of influence and are less likely to cause any accelerations of the winds further downwind.

Only after documenting all feasible attempts to reduce wind impacts via building massing and wind baffling measures on a building, shall the following be considered:

3. *Landscaping and/or Wind Baffling Measures in the Public Right-of-Way.* Landscaping and/or wind baffling measures shall be installed to slow winds along sidewalks and protect places where people walking are expected to gather or linger. Landscaping and/or wind baffling measures shall be installed on the windward side of the areas of concern (i.e., the direction from which the wind is blowing). Landscaping typically affects winds locally; the larger the tree crown and canopy, the greater the area of influence. Tall, slender trees with little foliage have little to no impact on local winds speeds at ground level because of the height of the foliage above ground. Shorter street trees with larger canopies help reduce winds around them but their influence on conditions farther away is limited. Examples of wind baffling measures may include street art to provide a sheltered area for people to walk and free-standing canopies and wind screens in areas where people walking are expected to gather or linger. If landscaping or wind baffling measures are required as one of the features to mitigate wind impacts, Mitigation Measure M-WS-1b (below) shall also apply:

Mitigation Measure M-WI-1b: Maintenance Plan for Landscaping and Wind Baffling Measures in the Public Right-of-Way. If it is determined that a subsequent project could not reduce additional wind hazards via massing or wind baffling measures on the subject building or the developer's property and therefore landscaping and/or wind baffling features are to be installed in the public right-of-way, the project sponsor for the subsequent project shall prepare a maintenance plan for review and approval by the San Francisco Planning Department to ensure maintenance of the features in perpetuity.

Implementation of Mitigation Measure M-WI-1a would require any subsequent projects taller than 85 feet in height to demonstrate that there would be no new exceedances of the wind hazard criterion, consistent with planning code section 825(d). Implementation of Mitigation Measure M-WI-1b would ensure that landscaping to reduce wind hazard exceedances be maintained in perpetuity. Therefore, this impact would be ***less than significant with mitigation***.

Impact C-WI-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts related to wind. ***(Less than Significant)***

There is one cumulative project within 1,600 feet of Seawall Lot 330, the only subsequent project site in the Waterfront Plan that could include buildings over 85 feet tall that could alter ground-level wind speeds.[172] This project is 429 Beale Street and 430 Main Street, which would construct a nine-story, 84-foot-tall building with a 15-foot-tall solarium and a 15-foot-tall mechanical penthouse on the roof, resulting in a maximum building height of 99 feet. The Initial Study – Community Plan Evaluation[173] for this project concluded the building would not cause project-level or cumulative exceedances of the wind hazard criterion.

Because wind effects are generally localized, the distance between Seawall Lot 330 and the 429 Beale Street and 430 Main Street project (430 feet) is large enough that minor changes in wind patterns resulting from this project would not combine with wind impacts from subsequent development of Seawall Lot 330. Therefore, any changes in wind patterns from development that could occur with implementation of the Plan would not combine with cumulative projects to result in a cumulative wind impact. The cumulative impact would be ***less than significant***.

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11. Shadow

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
11. SHADOW. Would the project:					
a) Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The Waterfront Plan area and surroundings have many publicly accessible areas. Publicly accessible areas considered in this analysis are public open spaces (see **Table 2**) located within 1,000 feet of the subsequent project sites identified in Table 4-2, Subsequent Project Sites Buildout Assumptions, p. 4-8 in Chapter 4 of the Draft EIR. A 1,000-foot study area around locations where development is assumed to occur pursuant to the Plan is based on the maximum shadow length of potential buildings in these locations. On the winter solstice, the sun would be at an angle of 9 degrees above the horizon one hour after sunrise or one hour before sunset, or a tangent of 0.16. Using the formula for calculating shadow length (length = height/tangent α, where α = sun angle in degrees), the maximum length of shadow for subsequent projects that could occur pursuant to the Plan would be 781 feet from development up to 125 feet at Seawall Lot 330 (Seawall Lot 330 has a maximum allowable height of 105 feet, or 125 feet including rooftop mechanical projections). Therefore, to account for

[172] Wind tunnel testing for the San Francisco Planning Department generally relies on a scale model that includes buildings and topography within 1,200 to 1,600 feet of a project site. Therefore, 1,600 feet around Seawall Lot 330 is considered an appropriate distance for considering the cumulative wind impacts of the Waterfront Plan in combination with nearby projects.

[173] San Francisco Planning Department, *Initial Study – Community Plan Evaluation, 429 Beale Street and 430 Main Street*, Case Number 2014-002033ENV.

changes in elevation, a 1,000-foot distance around all areas where subsequent projects could occur pursuant to the Plan is considered a conservative study area for the purposes of this analysis.

Table 2 Publicly Accessible Parks and Open Spaces in the Vicinity of the Plan Area

Jurisdiction	Port Subarea (within or proximate to)	Park/Open Space	Shaded by the Plan?
Port of San Francisco	Fisherman's Wharf	Pier 43 Promenade and Pier 45 Plaza	
		East Wharf Park	
	Northeast Waterfront	Cruise Terminal Plaza	
		Pier 14	
	South Beach	Rincon Park	
		Bryant/Embarcadero Plaza	X
		Beale/Embarcadero Plaza	
		Brannan Street Wharf	
		South Beach Park	
	Southern Waterfront	Crane Cove Park	
		Pier 70 Waterfront Terrace (under construction)	X
		Islais Creek Park/Tulare Park	
		Islais Landing	
		Bayview Gateway	X
		Heron's Head Park[a]	X
San Francisco Recreation & Parks Department	Northeast Waterfront	Chestnut and Kearny Open Space	
California Department of Transportation	South Beach	Rincon Hill Dog Park	X
POPOS	Northeast Waterfront	Waterfront Plaza	X
		Levi's Plaza	X
Multiple Agencies/Entities	All	San Francisco Bay Trail	X

SOURCE: Compiled by ESA in 2020

[a] Heron's Head Park is under Port jurisdiction, but is operated by the parks department.

APPROACH TO ANALYSIS

As shown in Table 2, there are 15 parks, public access, and natural areas within the Plan area under Port jurisdiction. Additionally, within the study area, there is one publicly accessible open space under the jurisdiction of the San Francisco Recreation & Parks Department (parks department), one open space owned by the California Department of Transportation (Caltrans), two privately owned public open spaces (POPOS), and the San Francisco Bay Trail, which falls under the jurisdiction of multiple agencies.

One park, the Pier 70 Waterfront Terrace, is a future park that is currently under construction. As this park does not yet exist, the net new shadow on this future park due to implementation of the Waterfront Plan is presented at the end of this discussion for informational purposes only.

IMPACTS AND MITIGATION MEASURES

Impact SH-1: The Waterfront Plan would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. ***(Less than Significant)***

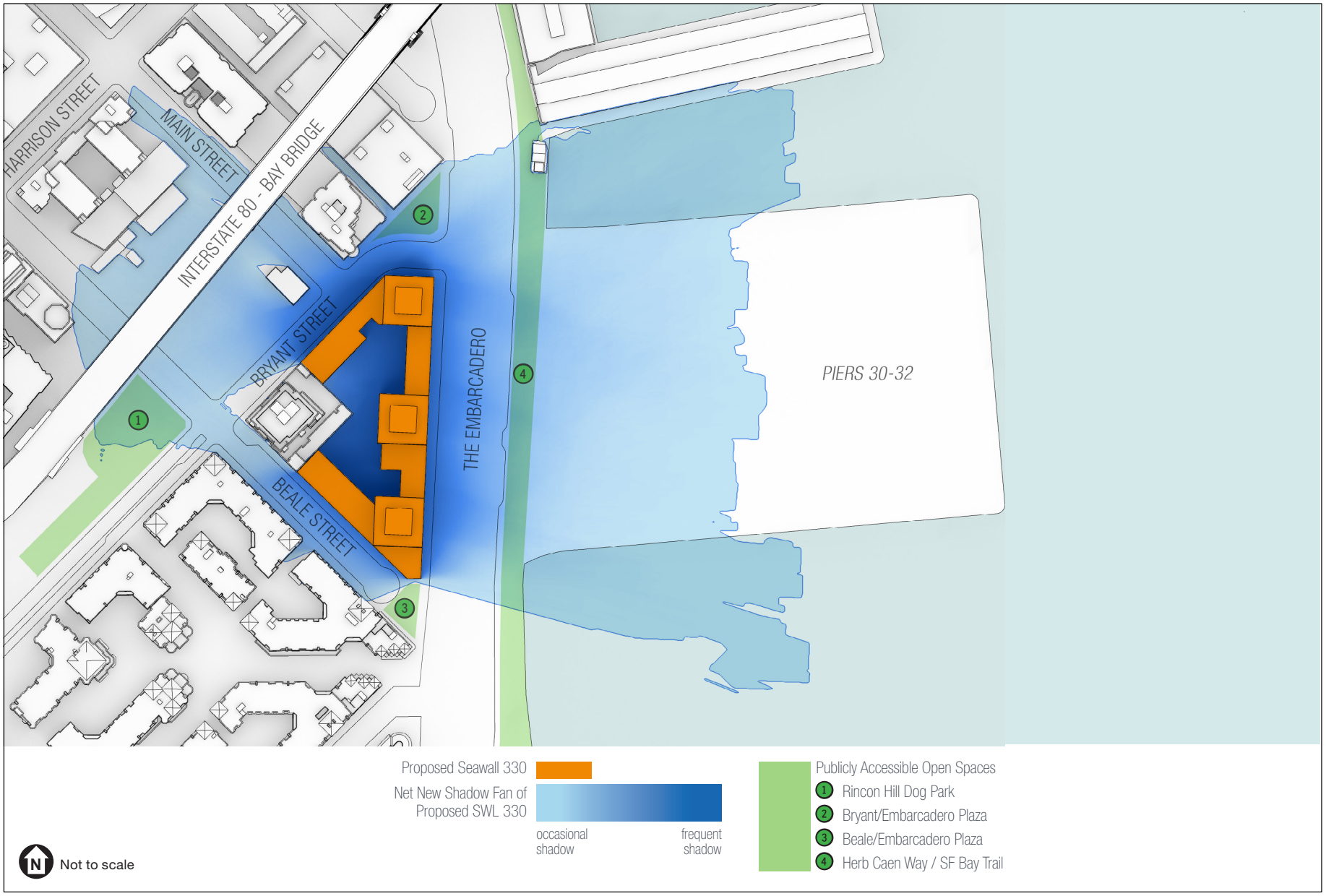
Planning code section 295 generally prohibits new structures above 40 feet in height that would cast additional shadows on open space that is under the jurisdiction of the San Francisco Recreation and Park Commission between one hour after sunrise and one hour before sunset, at any time of the year, unless that shadow would not result in a significant adverse effect on the use of the open space. Consistent with the requirements of section 295 of the planning code, a preliminary shadow fan was prepared only for Waterfront Plan-related development that could be over 40 feet in height. Subsequent projects that could be implemented pursuant to the Plan would occur on sites with a height limit of 40 feet, with one exception. The only property assumed to include buildings over 40 feet tall would be Seawall Lot 330, which is assumed for purposes of this analysis to include development up to the existing 105-foot height limit for that site. As shown in **Figure 1**, no parks department properties would be shaded between one hour after sunrise to one hour before sunset by a building on Seawall Lot 330. Therefore, development at Seawall Lot 330 would have no adverse impact on the use of any property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission, and no further analysis is required pursuant to section 295.

The CEQA analysis below focuses on whether or not development pursuant to the Plan would create new shadow in a manner that would substantially or adversely affect the use and enjoyment of publicly accessible open spaces, a significant impact under CEQA. Unlike section 295, CEQA requires analysis of all buildings proposed to be developed pursuant to the Plan, not just buildings taller than 40 feet in height.

In general, undeveloped seawall lots and piers could be developed with buildings that currently do not exist. Sites assumed for subsequent projects that could occur pursuant to the Plan are Seawall Lots 314 and 321 in the Northeast Waterfront subarea, where buildings could be developed up to 40 feet in height and could cover the entire sites; Piers 30 and 32, where buildings could be developed up to 40 feet tall and could cover approximately two-thirds of the site; Seawall Lot 330, where buildings could be developed up to 105 feet tall and would cover about half the site; the Pier 70 Triangle, where buildings could be developed up to 40 feet in height and cover two-thirds of the site (with setbacks from the north and south site boundaries); and Piers 90–94 Backlands, where buildings could be developed up to 40 feet tall and are assumed to cover one-third of the site.

Of the parks and open spaces in Table 2, p. 108, only Waterfront Plaza, Levi's Plaza, Bryant/Embarcadero Plaza, Rincon Hill Dog Park, Bayview Park, Heron's Head Park, and the San Francisco Bay Trail would receive shadow between the hours of one hour after sunrise to one hour before sunset.[174] Therefore, the discussion below focuses on these parks and open spaces, as well as other open spaces such as streets and sidewalks in the vicinity of the Plan (see Figure 2-3, p. 2-8; Figure 2-6, p. 2-11; Figure 2-9, p. 2-15; Figure 2-12, p. 2-19; and Figure 2-15, p. 2-23, of Chapter 2, Project Description).

[174] Shadow Calculator, http://shadowcalculator.eu/#, accessed May 14, 2021. While this tool is not precisely aligned with the shadow angles used in the section 295 analysis, the shadow consultant independently reviewed the output and confirmed that it approximates shadow effects for relatively flat areas in San Francisco, such as those along the waterfront.



SOURCE: PreVision Design, 2020

Waterfront Plan

FIGURE 1

SEA WALL LOT 330 SHADOW FAN

WATERFRONT PLAZA

Waterfront Plaza is a POPOS along the west side of The Embarcadero south of Bay Street in the Northeast Waterfront subarea. This open space contains benches, lawns, trees, shrubs, and meandering paths.

Development at Seawall Lot 314 would cast shadow on the northern portion of the Waterfront Plaza during the afternoon in the summer, but would not cast shadow during any other season. New shadow would affect only a minor portion of the northeastern corner of the open space. The affected area contains two benches and a small entrance plaza at the corner of Bay Street and The Embarcadero. The affected area is adjacent to a four-story building and is already in shade for most of the year by the adjacent building and mature trees. Therefore, users of this park are accustomed to shadow, in particular at this corner of the park, and the minor increase in shadow from development that could occur on this site pursuant to the Plan would not be noticeable. As such, development that could occur on Seawall Lot 314 pursuant to the Plan would not substantially or adversely affect the use and enjoyment of this park.

LEVI'S PLAZA

The majority of Levi's Plaza is a POPOS, but the southeastern corner is part of Seawall Lot 321. This open space is across The Embarcadero from the Exploratorium at Piers 15 and 17. Levi's Plaza features paved walking paths, benches, lawns, and a water fountain in the center of the park.

Development at Seawall Lot 321 would cast new shadow on a minor portion of Levi's Plaza from sunrise until 10:30 a.m. on the spring/fall equinox, and from sunrise until approximately 1 p.m. on the winter solstice. On these days, new shadow would cover a minor portion of a lawn and two benches on the southern portion of the park along The Embarcadero. New shadow would not affect the northern portion of Levi's Plaza, which contains a substantially larger grassy knoll, many other benches, an entrance courtyard to an office building, and a fountain. The portion of the plaza that receives the heaviest usage is the main area to the north of the area receiving new shadow. Because the main plaza area would not be adversely affected by new shadow, development that could occur on Seawall Lot 321 pursuant to the Plan would not substantially or adversely affect the use and enjoyment of this park

RINCON HILL DOG PARK

Development of buildings up to 105 feet tall on Seawall Lot 330 pursuant to the Waterfront Plan could cast shadow on the Rincon Hill Dog Park, a publicly accessible open space leased by the City from Caltrans at Beale and Bryant Streets, adjacent to the Bay Bridge. The Rincon Hill Dog Park features a paved entry plaza with concrete benches, a fenced small dog play area, and a fenced large dog play area. This park, located approximately 250 feet west of Seawall Lot 330, would receive shadow on the spring/fall equinox from sunrise until approximately 9 a.m. On the spring/fall equinox, shadow would cover approximately half the large dog play area on the southern portion of the park, all of the small dog play area to the north, and the entrance plaza to the park. Shadows would retreat to the east throughout the morning, eventually receding entirely from the park by 9:15 a.m.

On the summer solstice, new shadow from development on Seawall Lot 330 would cover most of the small dog area and the entrance to the park from sunrise until about 7:30 a.m. During this time, the entire park would be shaded from both existing shadow from the Watermark residential tower and development that could occur on Seawall Lot 330. By 7:45 a.m., new shadow from Seawall Lot 330 would recede from the park entirely.

New shadows from development on Seawall Lot 330 that could occur pursuant to the Plan would primarily affect this park between late March and late September early in the morning. The park is used for dog-related activities, such as playing fetch, dog walking, or socializing. Dog owners would likely continue using this park despite the slight increase in shadow early in the morning during this time period. Moreover, dog owners are often not as sensitive to increases in shadow as people who use parks for other activities, such as reading or eating on benches, because the primary purpose of their visit is to allow their dogs to play and exercise. As such, development that could occur on Seawall Lot 330 pursuant to the Plan would not substantially or adversely affect the use and enjoyment of the Rincon Hill Dog Park.

BRYANT/EMBARCADERO PLAZA

This 0.1-acre plaza is located at Seawall Lot 329 on land under the jurisdiction of the Port. The plaza, in the triangle created by the intersection of Bryant Street, The Embarcadero, and the building located at 2 Bryant Street, contains two grassy areas separated by a paved path. Development pursuant to the Waterfront Plan that could occur on Seawall Lot 330 could include buildings up to 105 feet tall, which would cast new shadow on the Bryant/Embarcadero Plaza throughout the winter.

The plaza is typically used by people walking. Due to its relatively small size compared to other nearby waterfront parks such as the Brannan Street Wharf Park and South Beach Park, the plaza is not used as often as these nearby parks for activities such as sitting or lying down. Moreover, the plaza does not contain benches or seating areas other than the two lawns. Because activities occurring at the Bryant/Embarcadero Plaza primarily include walking, this activity is less sensitive to increases in shadow as other passive recreational activities such as sitting or lying down. Therefore, development that could occur on Seawall Lot 330 pursuant to the Plan would not substantially or adversely affect the use and enjoyment of this plaza.

BAYVIEW GATEWAY PARK

Bayview Gateway Park is owned and operated by the Port of San Francisco, located at Third Street and Cargo Way in the Southern Waterfront subarea. Bayview Gateway Park features a skate park, landscaping, benches, and an open plaza adjacent to Islais Creek. On the summer solstice, this park would receive new shadow from subsequent projects that could occur pursuant to the Waterfront Plan on Piers 90–94 Backlands from sunrise until approximately 9:15 a.m. New shadow on the summer solstice would cover the skate park area, a portion of the fenced-off landscaped area adjacent to the skate plaza, and a minor amount of the seating area along Islais Creek.

On the fall/spring equinox, new shadow would cover all usable areas of the park between sunrise and 8:30 a.m. By 9:15 a.m., new shadow would cover only a minor portion of the skate plaza and seating area along Islais Creek, receding entirely from the park by 10:05 a.m.

On the winter solstice, new shadow would cover a large portion of the skate plaza and all of the seating area from sunrise until about 9:15 a.m., receding entirely from the park by 9:40 a.m.

New shadow on Bayview Gateway Park that could occur from subsequent projects on Piers 90–94 Backlands pursuant to the Plan would affect people skateboarding, as well as users of the seating area along Islais Creek early in the morning, but would not affect park users at any point during the year after 10:05 a.m. The skate plaza experiences the heaviest usage in the afternoon. It is also anticipated that the seating area along Islais Creek is primarily used during midday, or during the warmest period of the day. During these times, new shadow from subsequent projects that could occur on Piers 90–94 Backlands pursuant to the Plan would not

affect this park. As shadow would not affect the park after about 10 a.m. any time during the year, new shadow would not be cast during the time of the day when this park is most heavily used. Therefore, new shadow from subsequent projects that could occur pursuant to the Waterfront Plan on Piers 90–94 Backlands would not substantially or adversely affect the use and enjoyment of this park.

HERON'S HEAD PARK

Heron's Head Park is a 22-acre open space in the Southern Waterfront subarea under the jurisdiction of the Port of San Francisco. The park features an off-leash dog run, trails; a dedicated bike lane leading up to the park; bicycle racks; picnic tables; and The EcoCenter at Heron's Head Park, a Leadership in Energy and Environmental Design (LEED®) Platinum educational community center that generates its own power and includes water and wastewater collection and recycling systems. While the EcoCenter at Heron's Head Park is owned and maintained by the Port of San Francisco, it is operated by the parks department.

A small area along the northern portion of Heron's Head Park would receive new shadow from development that could occur pursuant to the Waterfront Plan on Piers 90–94 Backlands in the early morning—before 7 a.m.—around the summer solstice. New shadow would be cast east of The EcoCenter in an area of the park that contains grasses, shrubs, and other vegetation and functions as wildlife habitat. New shadow would cover an area of the park that is generally not used by people in the early morning and would not affect the dog run, bike lanes, bicycle racks, trails, or picnic tables. Therefore, new shadow from subsequent projects that could occur pursuant to the Plan on Piers 90–94 Backlands would not substantially or adversely affect the use and enjoyment of this park.

HERB CAEN WAY/SAN FRANCISCO BAY TRAIL

The San Francisco Bay Trail, a 350-mile walking and bicycling path around the entire San Francisco Bay, would receive new shadow from development that could occur pursuant to the Waterfront Plan on Seawall Lots 330, 314, and 321, as well as Piers 90–94 Backlands, throughout the year, primarily early in the morning and in the late afternoon. The San Francisco Bay Trail is primarily used for active uses, such as walking, jogging, and bicycling, and less for passive uses, such as sitting, reading, or eating. Active uses typically involve people walking, jogging, or bicycling, and they would experience new shadow cast by subsequent projects for a relatively short amount of time as they pass through new shaded areas. Because these activities and users are not particularly sensitive to the availability of sunlight, new shadow cast by subsequent projects that could occur pursuant to the Plan would not substantially or adversely affect the use and enjoyment of Herb Caen Way/San Francisco Bay Trail.

PUBLIC STREETS AND SIDEWALKS

Development that could occur pursuant to the Plan would increase shadows on public streets and sidewalks. These shadows would affect these spaces throughout the day and throughout the year to varying degrees but would be temporary in nature. Shadows on public streets and sidewalks could affect people walking, jogging, and bicycling; however, these activities are not particularly sensitive to an increase in temporary shadow. Moreover, users of sidewalks and streets would likely not notice the minor increase in shadow given the location of the Plan area in a densely developed part of San Francisco. Therefore, shadow resulting from subsequent projects that could occur pursuant to the Plan would not adversely or substantially affect the use and enjoyment of public streets and sidewalks.

Overall, new shadow resulting from subsequent projects that could occur pursuant to the Waterfront Plan could increase shadow on Waterfront Plaza, Levi's Plaza, Rincon Hill Dog Park, Bryant/Embarcadero Plaza, Bayview Park, Heron's Head Park, Herb Caen Way/San Francisco Bay Trail, and public streets and sidewalks. However, new shadow would be limited in both duration and extent, and would not adversely or substantially affect the use and enjoyment of any of these open spaces. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-SH-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts related to shadow. ***(Less than Significant)***

There are no cumulative projects that would combine with the Waterfront Plan to cast shadow on existing parks or open spaces. Therefore, subsequent projects that could occur pursuant to the Waterfront Plan, in combination with cumulative projects, would not result in a cumulative shadow impact. Accordingly, cumulative shadow impacts would be ***less than significant***.

Mitigation: None required.

INFORMATIONAL DISCUSSION OF FUTURE PARKS AND PUBLIC OPEN SPACES

PIER 70 WATERFRONT TERRACE (UNDER CONSTRUCTION AS PART OF THE PIER 70 PROJECT)

Because this park does not yet exist, net new shadow as a result of implementation of the Waterfront Plan could not result in a significant adverse impact under CEQA. Therefore, the discussion below is presented for informational purposes only.

Development that could occur pursuant to the Waterfront Plan on the Pier 70 Triangle site adjacent to historic Building 6, east of the Pier 70 shipyard, would cast new shadow on a small portion of the future Pier 70 Waterfront Terrace on the summer solstice between approximately 6:45 p.m. and sunset (8:35 p.m.). It should be noted that the Pier 70 Mixed-Use District Project, a cumulative project, would include buildings up to 90 feet tall adjacent to the future Waterfront Terrace, and also would cast shadow on the Waterfront Terrace during the same summer months as well. While usage of the park cannot be observed at the time of writing because the park is currently under construction, new shadow would cover a future viewing platform, referred to as the Building 6 Pavilion, which is intended to provide opportunities to experience views of the city.[175] Remaining areas of the future park that would not receive new shadow would include three other viewing pavilions: the Craneway Pavilion, the 22nd Street Pavilion, and the Public Rooftop Pavilion; a lawn; and a picnic terrace.[176] Therefore, future users of the Building 6 Pavilion seeking sunlight could use other non-shaded future viewing pavilions because, like the Building 6 Pavilion, they would also offer iconic views of the city and San Francisco Bay. While some park users may experience new shadow late in the afternoon in the summer, new shadow would be limited in extent and duration, and there would be other areas of the park that could

[175] SITELAB Urban Studio, *Pier 70 SUD Design for Development*, https://sfplanning.org/sites/default/files/documents/devagreements/Pier70/Pier70_DesignforDevelopment.pdf, accessed May 4, 2021.
[176] Ibid.

be used for the same purposes, which would not receive new shadow. Therefore, net new shadow from subsequent projects that could occur pursuant to the Waterfront Plan on the Pier 70 Waterfront Terrace would not substantially or adversely affect the use and enjoyment of this future park.

12. Recreation

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
12. RECREATION. Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The Port owns and maintains approximately 30 publicly accessible recreational and open spaces in the city, most of which lie along the 7.5 miles of Port waterfront. Together, with the approximately 2,457 acres of open space that is owned and managed by the parks department; the 255 acres, including the Candlestick Point State Recreation Area and Mount Sutro, owned and managed by the state; and the 1,642 acres, including the Presidio, Ocean Beach, Fort Funston, Fort Mason, Lands End, Sutro Heights, and China Beach, owned and managed by federal agencies, approximately 5,890 acres of parkland and open space are available within the city. These publicly owned open spaces makeup approximately 20 percent of the city's land area and include a variety of parks, walkways, landscaped areas, recreational facilities, and unmaintained open space.

The Waterfront Plan area includes numerous parks, recreational sites, and facilities and hosts varied activities along the shoreline. Recreational activities include boating and fishing at the Fisherman's Wharf, South Beach, Mission Bay, and Southern Waterfront subareas of the Plan area. Recreational facilities include public use piers, public boat launching sites, kayak rentals, public plazas, parks, walkways, and promenades in almost all areas of the waterfront. Recreational facilities within each of the subareas of the Plan area are described below.

FISHERMAN'S WHARF

Recreational areas in the Fisherman's Wharf subarea include public boat docking at Pier 39, Fisherman's Wharf, East Wharf Park, and Pier 43 Plaza and Promenade. The Pier 43 Promenade connects to Taylor and Jefferson streets, providing a pedestrian experience on the Wharf. The San Francisco Maritime National Historic Park is an open space and recreation area bounded by Van Ness Avenue and Beach and Hyde streets. The Maritime Museum, Hyde Street Pier, and Aquatic Park provide recreational boating facilities and recreational viewing of historic maritime boating facilities and artifacts.

NORTHEAST WATERFRONT

Existing recreational areas in the Northeast Waterfront subarea include Harry Bridges Plaza, Embarcadero Plaza, Pier 7, and Pier 14 open spaces. The James R. Herman Cruise Terminal Plaza (Herman Cruise Terminal) at Pier 27 provides pedestrian access to the cruise terminal and the bay. The cruise terminal includes approximately 2.5-acres of dedicated public open space with a lawn and benches. The cruise terminal also functions as an event space on non-cruise days. Pier 35 is a historic Port facility and secondary cruise ship berth to the Herman Cruise Terminal. The Pier 15 Exploratorium and Pier 17 facilities also support maritime services, provide deep-water berths, and provide educational science and art experiences. The Ferry Building and Harry Bridges plazas are open spaces at the intersection of Market Street and The Embarcadero. The Ferry Building Plaza hosts a weekly farmer's market that draws pedestrian traffic, recreational, and business activity to the Northeast Waterfront.

SOUTH BEACH

Parks and recreational areas in the South Beach subarea include the Rincon Park, Brannan Street Wharf, South Beach Park, and Ballpark PortWalk along Oracle Park and the Giants Promenade. South Beach Park adjacent to Pier 40 provides public access to the South Beach Harbor marina and features benches, lawn areas, and public art.[177] Rincon Park at the intersection of Folsom Street and The Embarcadero features a promenade, grassy open space, and tidal steps.

MISSION BAY AND SOUTHERN WATERFRONT SUBAREAS

The two Southern Waterfront subareas, Mission Bay and Southern Waterfront, include the Blue Greenway. The Blue Greenway is a 13-mile corridor along the southeast waterfront that includes publicly accessible open spaces, habitat restoration, the San Francisco Bay Trail, and water recreation facilities, and begins at the foot of the Lefty O'Doul Third Street Bridge and continues south to India Basin. Waterfront open space and parks include Bayfront and Mission Bay parks, Crane Cove Park, Pier 52 boat launch, India Basin open space and parks, Hunters Point Shipyard open spaces, Candlestick Point State Recreation Area, the Islais Creek public access to the Islais Creek Promenade, Pier 94, Yosemite Slough wetlands, and Heron's Head Park. New parks and open spaces will be developed as part of the Mission Rock neighborhood project on Seawall Lot 337, including China Basin Park, and Pier 70 Waterfront Terrace and Slipway Park.

SAN FRANCISCO PLANNING CODE OPEN SPACE REQUIREMENTS

The planning code requires the provision of usable open space in conjunction with development projects. Project sponsors are required to incorporate certain amounts of open space into development projects, depending on a project's use and size, as well as the zoning district in which the site is located, to serve future project residents and/or employees. Planning code section 135 requires open space to be provided for the use of residents in new dwelling units, with the amount required ranging from 36 to 300 square feet per unit. The requirement is generally higher in single-use residential districts than mixed-use residential districts. Commonly accessible open space (designed for joint use by two or more units) is permitted at a ratio that is typically 1.33 times the required amount for private open space.

[177] Port of San Francisco, Parks and Open Spaces, https://sfport.com/parks-and-open-spaces, accessed March 1, 2021.

FUTURE OPEN SPACE DEVELOPMENT IN THE CITY

In 2012, the voters of San Francisco passed the San Francisco Clean and Safe Neighborhood Parks Bond, providing the parks department with an additional $195 million to continue capital projects for the renovation and repair of park, recreational, and open space assets. Additionally, an update to the Recreation and Open Space Element (ROSE) of the general plan was adopted in April 2014. The amended ROSE provides a 20-year vision for open spaces in the city. It includes information and policies regarding accessing, acquiring, funding, and managing open spaces in San Francisco. The amended ROSE identifies locations where proposed open space connections should be built, specifically streets that would be appropriate for potential "living alleys." In addition, the amended ROSE identifies the role of both the Better Streets Plan and the Green Connections Network with respect to open space recreation. Green connections are streets and paths that connect people to parks, open spaces, and waterfront areas while enhancing the ecology of the street environment.

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. The Plan also would amend the planning code to create the Waterfront SUD 4, which would require waterfront design review process and procedures for future development on Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs. Effects on recreational facilities could result as subsequent projects pursuant to the Plan increase space for housing and employment within the Plan area. Therefore, this analysis considers how population growth resulting from implementation of the Waterfront Plan would affect recreational facilities. According to the CEQA significance criteria, the Waterfront Plan would have an adverse environmental impact if it were to deteriorate existing recreational facilities through increased use or require the construction or expansion of recreational facilities that may have an adverse effect on the environment.

IMPACTS AND MITIGATION MEASURES

Impact RE-1: The Waterfront Plan would increase the use of existing neighborhood and regional parks and other recreational facilities, but not to such an extent that substantial physical deterioration of the facilities would occur or be accelerated, or that the construction of new or expanded recreational facilities would be required. ***(Less than Significant)***

Goals and policies in the Waterfront Plan for future improvements in the Plan area that may affect recreational activity include expansion and enhancement of maritime facilities, design for new mixed-use developments, promotion of public and industrial uses, enhancement of public access, and coordination with SFMTA and other transportation partners to enhance open space development:

- **Fisherman's Wharf:** Policies encourage expansion of open space programming, a diverse mix of uses, maintenance of water-dependent activities, and enhancement of the pedestrian and bicycle experience to support recreational and economic vitality of the Fisherman's Wharf area.
- **Northeast Waterfront:** Policies encourage the provision of public access amenities that highlight newly created points of interest, more diverse recreational options and events to activate the Pier 27 Cruise Terminal Park, and wayfinding systems to enhance public enjoyment of the Northeast Waterfront open space and public access network.

- **South Beach:** Policies propose to maintain and activate an integrated series of parks and public access improvements that extend through South Beach, and provide a unifying pedestrian connection to Mission Bay at China Basin Channel.
- **Mission Bay:** Policies propose completion of the Blue Greenway public access and open space improvements through the Mission Bay waterfront.
- **Southern Waterfront:** Policies propose to improve and enhance Blue Greenway open space and public access areas that do not compromise maritime operations or sensitive environmental habitat areas, and provide education to promote public safety among maritime, small boating, and recreational water users.

Table 4-1, Draft EIR p. 4-5, presents the housing unit, population, and employment information for the Plan area in 2020 and the assumed growth in 2050. Growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. Population and job growth resulting from implementation of the Waterfront Plan would generate a permanent increase in demand for parks or other recreational facilities in the Plan area and vicinity. In addition, the Waterfront Plan's goals and policies promote public use of open space, enhancement and development of public access to waterfront areas, and expanded public transportation to historic piers and districts that would potentially generate increased use of existing, newly enhanced, or developed recreational facilities. However, the increase in employees, residents, and hence public use of recreational facilities would be addressed in part through implementation of the Plan, which would enhance open space programming at Fisherman's Wharf, provide public access amenities that highlight more diverse recreational opportunities in the Northeast Waterfront subarea, promote public access to new open spaces in the South Beach subarea, and complete the Blue Greenway public access and open space improvements though the Mission Bay and Southern Waterfront subareas.

Implementation of the Waterfront Plan would likely result in an increase in the use of recreational facilities due to subsequent projects that could occur pursuant to the Plan. However, this increase would not be significant enough to result in the physical deterioration of existing recreational facilities, nor would it result in construction of new or expanded recreational facilities. Furthermore, as noted above, the increase in the use of recreational facilities as a result of implementation of the Waterfront Plan would be addressed in part through implementation of the various Plan policies that seek to enhance open space programming and public access to new open spaces in the Plan area. Therefore, the Waterfront Plan would not increase the use of existing neighborhood and regional parks and other recreational facilities to such an extent that substantial physical deterioration of existing recreational facilities would occur or be accelerated, or that construction of new or expanded recreational facilities would be required. As such, the impact is ***less than significant***.

Mitigation: None required.

Impact C-RE-1: The Waterfront Plan, in combination with cumulative projects, would increase the use of existing neighborhood and regional parks and other recreational facilities, but not to such an extent that substantial physical deterioration of the facilities would occur or be accelerated, or that the construction of new or expanded recreational facilities would be required. ***(Less than Significant)***

The cumulative geographic context for recreational facilities for the Waterfront Plan considers growth projections for the Plan area and the city, in addition to all existing and potential new open spaces available to and accessible by the daytime and permanent population within the Waterfront Plan area. Proposed

projects within 0.25 mile of the Waterfront Plan area that include recreational and open space include Mission Rock, the Pier 70 Mixed-Use District Project, and the Potrero Power Station Mixed-Use Development Project. Mission Rock includes the rehabilitation of Pier 48 and Seawall Lot 337, including approximately 8 acres of expanded and new open space. Open space includes China Basin Shoreline Park, Mission Rock Square, Channel Wharf, Channel Lane, a waterfront promenade, and pedestrian walkways. The project also includes the expansion of recreational boat launch and public access to the aprons of Pier 48. The new pedestrian-centered Shared Public Way, which connects China Basin Shoreline Park to Long Street Bridge, is part of the new pedestrian-oriented street network connecting open spaces. The Pier 70 Mixed-Use District Project would include approximately 9 acres of new publicly accessible open space, including the Waterfront Promenade, the Pier 70 Waterfront Terrace, Building 12 Market Plaza and Market Square, Irish Hill Playground, and the 20th Street Plaza. The Potrero Power Station Mixed-Use Development Project includes development of approximately 7 acres of new open space and recreational facilities. In addition to a 3-acre waterfront park, the project would include a rooftop soccer field, a playground, a San Francisco Bay Trail extension, a 0.6-acre plaza, and 1.2-acre Power Station Park. The policies outlined in the Waterfront Plan would further seek to enhance open space programming and public access to new open spaces in the Plan area.

As discussed above, the Waterfront Plan would not increase the use of existing neighborhood and regional parks and other recreational facilities to such an extent that substantial physical deterioration of existing recreational facilities would occur or be accelerated, or that construction of new or expanded recreational facilities would be required. Additional recreational facilities also are being developed in the Plan area as part of Mission Rock, the Pier 70 Mixed-Use District Project, and the Potrero Power Station Mixed-Use Development Project. Furthermore, other planning efforts, both specific to nearby neighborhoods and citywide, are underway in San Francisco to address existing and future open space needs based on the growth projections for both the Plan area and city. As such, the Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact; therefore, cumulative impacts related to recreation would be ***less than significant***.

Mitigation: None required.

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13. Utilities and Service Systems

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
13. UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded, water, wastewater treatment, 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?	☐	☐	☒	☐	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate 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?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

The Waterfront Plan area is within an urban area that is served by existing public, private, and investor-owned utility service systems, with facilities for water, wastewater and stormwater collection and treatment, solid waste collection and disposal, and electrical power, natural gas, telecommunications. Subsequent projects that could occur pursuant to the Waterfront Plan would add new residents and daytime and nighttime users to the area that would increase the demand for utilities and service systems in the area. Descriptions of the city's water supply system, combined sewer system, and solid waste collection and disposal operations are provided below.

WATER

BACKGROUND ON HETCH HETCHY REGIONAL WATER SYSTEM

San Francisco's regional water system, operated by SFPUC, supplies water to approximately 2.7 million people. The system supplies both retail customers, primarily in San Francisco, and 28 wholesale customers in Alameda, Santa Clara, and San Mateo counties.[178] An average of 85 percent of the water supply is from the Tuolumne River watershed; this water is stored in the Hetch Hetchy Reservoir in Yosemite National Park. The remaining 15 percent is from local surface waters in the Alameda and Peninsula watersheds. The split among these resources varies from year to year, depending on hydrological conditions and operational circumstances. Separate from the regional water system, SFPUC owns and operates an in-city distribution system that serves retail customers in San Francisco. Approximately 97 percent of the San Francisco retail water supply is from the regional system; the remainder comprises local groundwater, recycled water, and non-potable water.[179]

[178] San Francisco Water Power Sewer, *2020 Urban Water Management Plan for the City and County of San Francisco*, prepared by San Francisco Public Utilities Commission, June 2021, https://sfpuc.org/sites/default/files/programs/local-water/SFPUC_2020_UWMP2020_%20FINAL.pdf, accessed September 30, 2021.

[179] San Francisco Public Utilities Commission, *2015 Urban Water Management Plan for the City and County of San Francisco*, June 2016, https://sfpuc.org/sites/default/files/programs/local-water/UWMP_2015_JUN2016.pdf, accessed September 30, 2021.

WATER SUPPLY RELIABILITY AND DROUGHT PLANNING

In 2008, SFPUC adopted the Water System Improvement Program (WSIP) to ensure the ability of the regional water system to meet certain level-of-service goals for water quality, seismic reliability, delivery reliability, and water supply.[180] SFPUC's level-of-service goal for regional water supply is to meet customer water needs in non-drought and drought periods and one of the phased WSIP Variant water supply elements is to meet dry-year delivery needs while limiting rationing to a maximum of 20 percent system-wide in any one year. In approving the WSIP, SFPUC established a supply limitation of 265 million gallons per day (mgd) from its water supply resources in the Tuolumne, Alameda and Peninsula watersheds in normal years.[181] SFPUC's water supply agreement with its wholesale customers ensures that up to 184 mgd is available to wholesale purchasers, and the remaining, up to 81 mgd, is available to retail customers. The total amount of water SFPUC can deliver to retail and wholesale customers in any one year depends on several factors, including the amount of water that is available from natural runoff, the amount of water in reservoir storage, and the amount of that water that must be released from the system for purposes other than customer deliveries (e.g., required instream flow releases below reservoirs). The term "normal year" refers to hydrological conditions that allow the reservoirs to be filled over the course of the snowmelt season, thereby allowing full deliveries to customers; similarly, the terms "wet year" and "dry year" refer to hydrological conditions with above and below "normal" rainfall and snowmelt, respectively.

For planning purposes, SFPUC uses a hypothetical drought that is more severe than what has historically been experienced. This drought sequence is referred to as the "design drought" and serves as the basis for planning and modeling future scenarios. The design drought sequence used by SFPUC for water supply reliability planning uses an 8.5-year period that combines the following elements:

- Historical Hydrology: A 6-year sequence of hydrology from the historical drought that occurred from July 1986 to June 1992.
- Prospective Drought: A 2.5-year period that includes hydrology from the 1976–1977 drought.
- System Recovery Period: The last six months of the design drought are the beginning of the system recovery period. Precipitation begins in the fall, and by approximately December, inflow to reservoirs exceeds customer demands, and SFPUC system storage begins to recover.

Although the most recent drought (2012 through 2015) included some of the driest years on record for SFPUC watersheds, the design drought still represents a more severe drought with respect to duration and overall water supply deficit.[182]

Based on historical records of hydrology and reservoir inflow from 1920 to 2017 and current delivery and flow obligations, with fully implemented infrastructure under the WSIP, normal or wet years occurred in 85 out of 97 years. This translates into roughly nine normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly one out of every 10 years. However, the frequency of dry years is expected to increase as climate change intensifies.

[180] On December 11, 2018, SFPUC extended the timing of the WSIP water supply decision through 2028 in its Resolution No. 18-0212.
[181] SFPUC Resolution No. 08-200, Adoption of the Water System Improvement Program Phased WSIP Variant, October 30, 2008.
[182] Ibid.

2020 URBAN WATER MANAGEMENT PLAN

SFPUC adopted the 2020 Urban Water Management Plan (2020 plan) in June 2021.[183] The 2020 plan estimates that current and projected water supplies will be sufficient to meet future demand for retail water[184] customers through 2045 under wet- and normal-year conditions; however, in dry years, SFPUC would implement water use reductions and supply allocations through its Water Shortage Contingency Plan and Retail Water Shortage Allocation Plan. [185]

In December 2018, the State Water Resources Control Board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, which establishes water quality objectives to maintain the health of our rivers and the Bay-Delta ecosystem (the Bay-Delta Plan Amendment).[186] The state water board has indicated that it intends to implement the Bay-Delta Plan Amendment by the year 2022, assuming all required approvals are obtained by that time. Implementation of the Bay-Delta Plan Amendment for retail would result in significant shortfalls during dry years, requiring up to 35 percent water use reductions.

Implementation of the Bay-Delta Plan Amendment is uncertain for several reasons. In acknowledgment of these uncertainties, the 2020 plan presents future supply scenarios both with and without the Bay-Delta Plan Amendment, as follows:

1. Without implementation of the Bay-Delta Plan Amendment wherein the water supply and demand assumptions contained in Section 8.4 of the 2020 plan would be applicable
2. With implementation of a voluntary agreement between SFPUC and the State Water Resources Control Board that would include a combination of flow and non-flow measures that are designed to benefit fisheries at a lower water cost, particularly during multiple dry years, than would occur under the Bay-Delta Plan Amendment)
3. With implementation of the Bay-Delta Plan Amendment as adopted wherein the water supply and demand assumptions contained in Section 8.3 of the 2020 plan would be applicable

Water supply shortfalls during dry years would be lowest without implementation and highest with implementation of the Bay-Delta Plan Amendment. Shortfalls under the proposed voluntary agreement would be between those with and without implementation of the Bay-Delta Plan Amendment.[187]

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[183] SFPUC, *2020 Urban Water Management Plan for the City and County of San Francisco*, adopted June 11, 2021, https://www.sfpuc.org/about-us/policies-plans/urban-water-management-plan.

[184] "Retail" demand represents water SFPUC provides to individual customers within San Francisco. "Wholesale" demand represents water SFPUC provides to other water agencies supplying other jurisdictions.

[185] San Francisco Public Utilities Commission, *2020 Urban Water Management Plan for the City and County of San Francisco, Appendix K – Water Shortage Contingency Plan,* adopted June 11, 2021, https://www.sfpuc.org/about-us/policies-plans/urban-water-management-plan.

[186] State Water Resources Control Board Resolution No. 2018-0059, Adoption of Amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary and Final Substitute Environmental Document, December 12, 2018, https://www.waterboards.ca.gov/plans_policies/docs/2018wqcp.pdf.

[187] On March 26, 2019, SFPUC adopted Resolution No. 19-0057 to support its participation in the voluntary agreement negotiation process. To date, those negotiations are ongoing under the California Natural Resources Agency. SFPUC submitted a proposed project description that could be the basis for a voluntary agreement to the state water board on March 1, 2019. As the proposed voluntary agreement has yet to be accepted by the state water board as an alternative to the Bay-Delta Plan Amendment, the shortages that would occur with its implementation are not known with certainty; however, if accepted, the voluntary agreement would result in dry year shortfalls of a lesser magnitude than under the Bay-Delta Plan Amendment.

Under these three scenarios, SFPUC would have adequate water to meet demand in San Francisco through 2045 in wet and normal years.[188] Without implementation of the Bay-Delta Plan Amendment, water supplies would be available to meet demand in all years except for a 4.0 million gallons per day (5.3 percent) shortfall in years four and five of a multiple-year drought based on 2045 demand.

With implementation of the Bay-Delta Plan Amendment, shortfalls would range from 11.2 million gallons per day (15.9 percent) in a single dry year to 19.2 million gallons per day (27.2 percent) in years two through five of a multiple-year drought based on 2025 demand levels and from 20.5 million gallons per day (25.4 percent) in a single dry year to 28.5 million gallons per day (35.4 percent) in years four and five of a multiple year drought based on 2045 demand.

No single development project alone in San Francisco would require the development of new or expanded water supply facilities or require SFPUC to take other actions, such as imposing a higher level of rationing across the city in the event of a supply shortage in dry years. Therefore, a separate project-only analysis is not provided for this topic. The following analysis instead considers whether the Waterfront Plan in combination with both existing development and projected growth through 2045 would require new or expanded water supply facilities, the construction or relocation of which could have significant impacts on the environment that were not identified in the Draft EIR. It also considers whether a high level of rationing would be required that could have significant cumulative impacts. It is only under this cumulative context that development in San Francisco could have the potential to require new or expanded water supply facilities or require SFPUC to take other actions, which in turn could result in significant physical environmental impacts related to water supply. If significant cumulative impacts could result, then the analysis considers whether the project would make a considerable contribution to the cumulative impact.

WASTEWATER/STORMWATER COLLECTION AND TREATMENT

SFPUC provides wastewater services to San Francisco County and a portion of northern San Mateo County.[189] San Francisco's wastewater collection, treatment, and disposal system consists primarily of a combined sewer system, which collects both sewage and stormwater; three wastewater treatment plants; and effluent outfalls to the bay and the Pacific Ocean.[190] The system's approximately 1,000 miles of underground pipes serve most of San Francisco. SFPUC maintains and operates three wastewater treatment facilities for the city: the Oceanside Water Pollution Control Plant, the Southeast Treatment Plant (SEP), and the North Point Wet-Weather Facility (NPF). These facilities combined can treat up to 575 mgd of wastewater and stormwater runoff.[191]

The Plan area is served by the SEP. The SEP treats 57 mgd of wastewater and up to 250 mgd during rain storms.[192] The Plan area is also served by the NPF during wet weather, which operates when the SEP approaches capacity. The NPF has the capacity to treat 150 mgd when it rains.[193] During wet weather, the capacity at the SEP is also supplemented by a series of storage/transport boxes located around the perimeter

[188] Based on historic records of hydrology and reservoir inflow from 1920 to 2017, current delivery and flow obligations, and fully implemented infrastructure under the 2018 Phased Water System Improvement Program Variant, normal or wet years occurred 85 out of 97 years. This translates into roughly nine normal or wet years out of every 10 years. Conversely, system-wide rationing is required roughly one out of every 10 years. This frequency is expected to increase as climate change intensifies.
[189] San Francisco Public Utilities Commission, *Our Systems*, https://sfpuc.org/about-us/our-systems, November 10, 2021.
[190] San Francisco Public Utilities Commission, Wastewater Collection System, 2018, https://sfpuc.org/about-us/our-systems/sewer-system/wastewater-collection-system, February 2, 2021.
[191] San Francisco Public Utilities Commission, *Sewer System,* https://sfpuc.org/about-us/our-systems/sewer-system, November 10, 2021.
[192] Ibid.
[193] Ibid.

of the city. If wet-weather flows exceed the capacity of the overall system, the excess (primarily stormwater) is discharged from one of the 36 combined sewer overflow structures along the waterfront.

SOLID WASTE

San Francisco uses a three-cart collection program that requires, under the City's Mandatory Recycling and Composting Ordinance (ordinance 100-09), residents and businesses to sort solid waste into recyclables; compostable items, such as food scraps and yard trimmings; and garbage. Recology provides solid waste collection, recycling, and disposal services for residential and commercial customers in San Francisco through its subsidiaries, San Francisco Recycling and Disposal, Golden Gate Disposal and Recycling, and Sunset Scavenger.[194] Refuse materials are collected and hauled to the Recology Transfer Station/recycling center on Tunnel Avenue, near the southeastern city limit, for sorting and subsequent transport to other facilities. Recyclable materials are sent to Recology's Recycle Central facility at Pier 96, where they are separated and sold to manufacturers that turn the materials into new products. Compostable items are also taken to the Recology Transfer Station on Tunnel Avenue. The total demand on Recycle Central is approximately 1,000 tons per day, and the total demand on the Recology Transfer Station is approximately 2,000 tons per day.[195]

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Plan to reflect revised or new goals, policies, and procedures and would amend the planning code to create the Waterfront SUD 4. Effects on population and housing could result as subsequent projects that could occur pursuant to the Waterfront Plan could add new residential and commercial, maritime, or mixed-use projects on undeveloped seawall lots and piers.

Table 4-1, Draft EIR p. 4-5, presents the housing unit, population, and employment information for the Plan area in 2020 and the assumed growth in 2050. The 2020 existing conditions for the Plan area includes 410 housing units, approximately 850 residents, and approximately 12,910 jobs. Growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. Therefore, the existing conditions plus growth assumed with implementation of the Waterfront Plan would total approximately 670 housing units, approximately 1,380 residents, and approximately 27,700 jobs.

Effects on utilities and service systems could result as subsequent projects that could occur pursuant to the Waterfront Plan introduce new businesses, housing, and population to the Plan area. Accordingly, the analysis in this section evaluates the potential effects of the Waterfront Plan on utilities and service systems.

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[194] Mandatory Recycling and Composting, File No. 081404, Ordinance No. 100-09, 2009, https://sfenvironment.org/sites/default/files/policy/sfe_zw_sf_mandatory_recycling_composting_ord_100-09.pdf, accessed February 2, 2021.

[195] San Francisco Planning Department, *Draft Environmental Impact Report, The Hub Plan, 30 Van Ness Avenue Project, 98 Franklin Street Project, and Hub Housing Sustainability District*, Case Numbers: 2015-000940ENV, 2017-008051ENV, 2016-014802ENV, Draft EIR Appendix B (Initial Study), 2019, https://sfplanning.org/environmental-review-documents?title=HUB&field_environmental_review_categ_target_id=214&items_per_page=10, accessed February 2, 2021.

IMPACTS AND MITIGATION MEASURES

Impact UT-1: Sufficient water supplies are available to serve the Waterfront Plan and reasonably foreseeable future development in normal, dry, and multiple dry years unless the Bay Delta Plan Amendment is implemented; in that event SFPUC may develop new or expanded water supply facilities to address shortfalls in single and multiple dry years, but this would occur with or without implementation of the Waterfront Plan. Impacts related to new or expanded water supply facilities cannot be identified at this time or implemented in the near term; instead, SFPUC would address supply shortfalls through increased rationing, which could result in significant cumulative effects, but the implementation of the Waterfront Plan would not make a considerable contribution to impacts from increased rationing. ***(Less than Significant)***

The Waterfront Plan does not require a water supply assessment under the California Water Code. Under California Water Code sections 10910 through 10915, urban water suppliers like SFPUC must prepare water supply assessments for certain "water demand projects," as defined in CEQA Guidelines section 15155.[196] Based on guidance from the California Department of Water Resources and a citywide demand analysis, SFPUC has established 50,000 gallons per day as the maximum water demand for projects that do not meet the definitions provided in CEQA Guidelines section 15155(a)(1).[197] As a policy document intended to set long-term goals and policies to guide the use, management, and improvement of 7.5 miles of properties owned and managed by the Port, the Waterfront Plan itself does not qualify as a "water-demand project" as defined by CEQA Guidelines section 15155(a)(1) and a water supply assessment is not required and has not been prepared for the Plan. However, subsequent projects that could occur with implementation of the Waterfront Plan would be evaluated at such time that they are proposed to determine if the project would require a water supply assessment.

It should be noted that subsequent projects would be required to incorporate water-efficient fixtures as required by California Code of Regulations title 24 and the City's Green Building Ordinance.[198] Although a water supply assessment was not prepared for the Waterfront Plan for the reasons noted above, an estimate of future water supply demand for subsequent projects that could occur under the Waterfront Plan was developed using SFPUC's non-potable water calculator. Based on the calculator, subsequent projects under the Waterfront Plan could result in a potable water demand of approximately 73,920 gallons of water per day, which represents approximately 0.09 percent of the city's estimated total water demand of 80.6 million gallons per day in 2045.

For subsequent projects that do not meet the definition of a project requiring a water supply assessment, sufficient water supplies are available to serve the subsequent project and reasonably foreseeable future

[196] Pursuant to CEQA Guidelines section 15155(1), "a water-demand project" means:
- (A) A residential development of more than 500 dwelling units.
- (B) A shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
- (C) A commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor area.
- (D) A hotel or motel, or both, having more than 500 rooms, (e) an industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.
- (F) A mixed-use project that includes one or more of the projects specified in subdivisions (a)(1)(A), (a)(1)(B), (a)(1)(C), (a)(1)(D), (a)(1)(E), and (a)(1)(G) of this section.
- (G) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

[197] Memorandum, from Steven R. Ritchie, Assistant General Manager, Water Enterprise, San Francisco Public Utilities Commission to Lisa Gibson, Environmental Review Officer, San Francisco Planning Department – Environmental Planning, May 31, 2019.

[198] Subsequent projects that could occur under the Waterfront Plan may need to comply with the Non-Potable Water Ordinance and other ordinances related to water conservation.

development in normal years. SFPUC also has indicated that it is accelerating its efforts to develop additional water supplies and explore other projects that would improve overall water supply resilience through an alternative water supply program. SFPUC has taken action to fund the study of additional water supply projects, but it has not determined the feasibility of the possible projects and has determined that the identified potential projects would take anywhere from 10 to 30 years or more to implement. Because these water supply projects would take 10 to 30 years to implement, and because required environmental permitting negotiations may reduce the amount of water that can be developed, the yield from these projects are not currently incorporated into the SFPUC's supply projections. The potential impacts that could result from the construction and/or operation of any such water supply facility projects cannot be identified at this time. If all the projects identified through the current planning process could be implemented, there would still be a supply shortfall to meet projected needs.

Given the long lead times associated with developing additional water supplies, in the event the Bay-Delta Plan Amendment were to take effect sometime after 2022 and result in a dry-year shortfall, the expected action of SFPUC for the next 10 to 30 years (or more) would be limited to requiring increased rationing. As discussed in the SFPUC memorandum, SFPUC has established a process through its Retail Water Shortage Allocation Plan for actions it would take under circumstances requiring rationing. The level of rationing that would be required for subsequent projects is unknown at this time. Both direct and indirect environmental impacts could result from high levels of rationing. However, the small increase in potable water demand attributable to subsequent projects that do not meet the definition of requiring a water supply assessment compared to citywide demand (approximately 0.09 percent) would not substantially affect the levels of dry-year rationing that would otherwise be required throughout the city. Thus, the need to develop new or expanded water supplies in response to the Bay Delta Plan Amendment and any related environmental impacts would occur irrespective of the water demand associated with subsequent projects under the Waterfront Plan. For these reasons, the Waterfront Plan would not make a considerable contribution to a cumulative environmental impact caused by implementation of the Bay-Delta Plan Amendment. However, as noted above, subsequent projects would be evaluated at such time that they are proposed to determine if the project would require a water supply assessment and whether or not it would result in a significant impact on water supply. As such, the Waterfront Plan impacts related to water supply would be ***less than significant***.

Mitigation: None required.

Impact UT-2: The Waterfront Plan would not require or result in the relocation or construction of new or expanded, water, wastewater treatment, 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)***

Growth within the Waterfront Plan area could result in increased wastewater and stormwater flows into the combined sewer system. When increased flows exceed the combined storage and treatment capacity of the SEP, NPF, and the transport and storage boxes, excess flows are discharged to the bay after receiving primary treatment. An increase in the frequency of combined sewer discharge from the watershed could be a concern because combined sewer discharges contain pollutants for which the bay is designated as an impaired water body pursuant to the CWA.

The subsequent projects that could occur pursuant to the Waterfront Plan could result in changes in flows to the city's combined sewer system, including (1) changes in the amount of wastewater generated and

(2) changes in stormwater runoff volumes and rates. The effects on the combined sewer system and frequency of combined sewer discharges to the bay is discussed below, along with the potential to exceed the wastewater treatment capacity of the SEP.

WASTEWATER AND STORMWATER TREATMENT REQUIREMENTS

CONSTRUCTION

Wastewater generation would occur periodically throughout the construction period for subsequent projects that could occur pursuant to the Waterfront Plan. Construction activities could increase wastewater generation as a result of dewatering and demand from onsite construction workers. However, this demand would be temporary and nominal. Construction dewatering discharges would result in short-term increases in demand on existing wastewater or storm drainage facilities, but proposed dewatering discharge methods would include options for direct discharge to the bay under an existing National Pollutant Discharge Elimination System (NPDES) general permit. This would ensure that any discharges to the combined sewer system would be within the capacity of existing facilities and would not require the construction or expansion of existing facilities. If discharged directly to the bay, the dewatering discharges would be subject to the permitting requirements of the San Francisco Bay Regional Water Quality Control Board (regional board) under the NPDES Volatile Organic Compound and Fuel General Permit (discussed in Section E.17, Hydrology and Water Quality), which typically involve reporting and monitoring requirements for discharges of extracted and treated groundwater.

Accordingly, in coordination with the Port, project sponsors and construction contractors for subsequent projects that could occur with implementation of the Waterfront Plan would be required to submit a notice of intent to the regional board describing the proposed discharge and treatment system, and the regional board must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit. The treated water would most likely flow through a stormwater swale and discharged through an existing outfall pipe. Regular influent and effluent water quality monitoring would be conducted to demonstrate permit compliance. Therefore, implementation of subsequent projects pursuant to the Waterfront Plan would result in a minimal increase in wastewater generation and would not be anticipated to have a substantial adverse impact on available wastewater treatment or conveyance capacity. Therefore, impacts during construction would be ***less than significant***.

Mitigation: None required.

OPERATION

Wastewater associated with operation of land uses within the Waterfront Plan area would flow to the city's combined stormwater and sewer system and be treated to the standards of the City's NPDES permit for the SEP. Stormwater from land uses within the Waterfront Plan area would flow either to the city's separate stormwater systems (which must comply with standards of the NPDES permit for Small Municipal Separate Storm Sewer Systems) or to the combined sewer system. Either the stormwater from the separate stormwater systems or the treated water from the combined sewer system would be discharged to the bay. The regional board sets and regulates NPDES requirements. Subsequent projects that could occur pursuant to the Waterfront Plan would comply with regional board standards, as well as the City's Stormwater Management Ordinance (ordinance 83-10), which would require development pursuant to the Waterfront Plan to reduce the existing volume and rate of stormwater runoff discharged from the Plan area. To achieve this, subsequent projects in the Plan area would implement and install appropriate stormwater management systems to

manage stormwater onsite and limit demand on both collection system and wastewater facilities resulting from stormwater discharges. Because subsequent projects that could occur pursuant to the Waterfront Plan would result in ground disturbance of an area greater than 5,000 square feet, a stormwater control plan would be prepared for review and approval by SFPUC. The stormwater control plan would include a maintenance agreement that must be signed by the project sponsor to ensure proper care of the necessary stormwater controls. Therefore, subsequent projects that could occur with implementation of the Waterfront Plan would not exceed the wastewater treatment requirements of the regional board, and impacts would be ***less than significant***.

Mitigation: None required.

WASTEWATER FACILITIES

All wastewater flows from subsequent projects in the Plan area would be treated at the SEP or the NPF (during wet weather) prior to discharge through an existing outfall or overflow structure to the bay.

The volume of wastewater flows to the combined sewer system would be directly related to the amount of water used for purposes such as washing dishes and clothes, washing hands, flushing urinals and toilets, and operating water-cooled heating and ventilation systems. Subsequent projects implemented pursuant to the Waterfront Plan would be required to comply with San Francisco's Non-Potable Water Program, which requires developers of buildings of 250,000 square feet or more to use non-potable water for toilet and urinal flushing. One potential source of non-potable water for these purposes is gray water generated onsite (e.g., from bathtubs, showers, bathroom sinks, washing machines, laundry tubs, cooling units). If subsequent projects use onsite gray water for flushing, the amount of wastewater discharged to the combined sewer would be reduced by the approximate volume of gray water used. Because the program also allows the use of other non-potable water, such as rainwater and foundation drainage, for these purposes, it is reasonable to assume that half of the non-potable water demand would be met with onsite sources of gray water, which would reduce wastewater flows. In addition, a portion of the water would be consumed onsite rather than discharged to the sewer, and water use estimates do not account for use of recycled water in conjunction with sustainable designs, including LEED® standards. Finally, the California Building Code is updated every 3 years; after each update, the City and the Port adopt most of the statewide changes into their own building codes. Future code versions are likely to include more stringent water conservation and recycling requirements, which would decrease the potable water demand from subsequent projects, although the effects of these as-yet undefined changes on wastewater flows cannot be quantified.

In 2020, average daily dry weather flow effluent from the Southeast Water Pollution Control Plant was 41.5 mgd, which is approximately 43.9 mgd less than the permitted 85.4 mgd discharge limit of the plant.[199] Dry weather flow characterizes wastewater volumes flowing into the combined sewer system, which are considerably smaller than stormwater flows into the same system. As discussed in Section E.3, Population and Housing, the Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur in regional growth forecasts. Increases in wastewater generation due to additional subsequent projects that could be constructed with implementation of the Waterfront Plan would be partially offset by compliance with San Francisco's Non-Potable Water Program, LEED® standards, and the California Building Code. The additional wastewater generation resulting from planned growth within the Plan area would be accommodated by the city's existing wastewater infrastructure because adequate capacity

[199] San Francisco Public Utilities Commission, 2021. City and County of San Francisco Water Pollution Prevention Program Annual Report, Reporting Period of January 1, 2020–December 31, 2020. February 28, 2021.

(43.9 mgd) remains in the Southeast Plant (which would treat wastewater generated in the Waterfront Plan area). Therefore, no additional wastewater facilities would need to be built to accommodate implementation of the Waterfront Plan, and the impact would be ***less than significant***.

Mitigation: None required.

STORMWATER FACILITIES

No stormwater utility infrastructure upgrades are anticipated with implementation of the Waterfront Plan. In the event that stormwater utility infrastructure upgrades become necessary, compliance with stormwater quality regulations would be ensured during the planning and construction phases, in accordance with the existing San Francisco regulations described in Section E.17, Hydrology and Water Quality.

Subsequent projects within the Plan area would be designed to meet the City's Stormwater Management Requirements and Design Guidelines (SMR). Development sites would be required to implement stormwater treatment measures, either at each individual site or within centralized stormwater management areas. In accordance with San Francisco's Stormwater Management Ordinance (San Francisco Public Works Code article 4.2) and SMR, subsequent projects that could occur pursuant to the Waterfront Plan would need to comply with the City's SMR. Accordingly, all projects that create or replace 5,000 square feet or more of impervious surfaces would be required to minimize the flow and volume of stormwater into the combined sewer system. The Plan area, as well as most of the city, is almost entirely covered by impervious surfaces at present, and all subsequent projects would be located on sites that are already developed. Therefore, subsequent projects that could occur pursuant to the Waterfront Plan that create or replace 5,000 square feet or more of impervious surfaces would be required to achieve a 25 percent reduction in the peak rate and total volume of stormwater runoff from the 2-year, 24-hour design storm compared with existing conditions. Smaller projects that create or replace between 2,500 and 5,000 square feet of impervious surfaces in separate sewer areas would need to implement at least one site design measure, as outlined in the SMR, and submit an estimate runoff reduction volume to SFPUC using the state board's SMARTS calculator.[200]

To achieve compliance, the subsequent projects pursuant to the Waterfront Plan that create or replace at least 2,500 square feet or more of impervious surfaces would be required to incorporate low-impact design techniques into the project design. Larger projects disturbing at least 5,000 square feet also would have to implement stormwater best management practices to reduce the flow rate and volume of stormwater entering the combined sewer system. Recommended best management practices to achieve these goals include infiltration methods, such as bio-retention areas, pervious paving, and other measures to minimize impervious surfaces. Reuse of stormwater for non-potable uses, such as irrigation or toilet and urinal flushing, in accordance with the City's Non-Potable Water Program, also would reduce the volume of stormwater discharged to the combined sewer system.

Compliance with the San Francisco Green Building Ordinance requirements and the City's SMR would ensure that runoff water from the Plan area would not exceed the capacity of existing or planned stormwater drainage systems. Furthermore, the Plan area is currently largely impervious, and subsequent projects that could occur pursuant to the Waterfront Plan would not be anticipated to increase stormwater runoff rates and volumes

[200] San Francisco Public Utilities Commission, *Stormwater Requirements*, https://sfpuc.org/construction-contracts/design-guidelines-standards/stormwater-requirements, accessed February 2, 2021.

stormwater flows to the SEP; thus, the capacity of the SEP would not be adversely affected. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

ELECTRICAL POWER, NATURAL GAS, AND TELECOMMUNICATIONS FACILITIES

Pacific Gas & Electric Company and San Francisco Public Utilities Commission provide electricity and natural gas to the project site, and various private companies provide telecommunications facilities. Construction and operation of subsequent projects within the Plan area would result in an incremental increase in the demand for electricity, natural gas, and telecommunications. However, future development in the Plan area would consist primarily of infill and redevelopment projects, which would not substantially increase the amount of electric power, natural gas, and telecommunications required. In addition, as discussed in Section E.3, Population and Housing, the Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur in regional growth forecasts. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact UT-3: The Waterfront Plan would not generate solid waste in excess of state or local standards or in excess of the capacity of local infrastructure, and would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. ***(Less than Significant)***

In September 2015, the City entered into a landfill disposal agreement with Recology, Inc. for disposal of all solid waste collected in San Francisco, at the Recology Hay Road Landfill in Solano County.[201] The Recology Hay Road Landfill has a permitted remaining capacity of 30,433,000 cubic yards and is expected to continue to receive waste approximately through the year 2077.[202] The City's contract with the Recology Hay Road Landfill will extend until 2031 or when the City has disposed 5 million tons of solid waste, whichever occurs first. At that point, the City would either further extend the landfill contract or find and entitle an alternative landfill site.

Furthermore, subsequent projects that could occur pursuant to the Waterfront Plan would be required to implement the City's Mandatory Recycling and Composting Ordinance (Ordinance No. 100-09), the objective of which is to minimize the city's landfill trash generation. In compliance with this ordinance, subsequent projects would be required to provide convenient facilities for the separation of recyclables, compostables, and landfill trash for its users. Occupants of the subsequent projects would be required to separate disposed material.

Construction of subsequent projects also would generate demolition and construction waste. The San Francisco Green Building Code requires that 100 percent of construction waste must be taken by a registered transporter to a registered facility and processed for recycling. The code also requires submittal of a material reduction and recovery plan and supporting documentation demonstrating the minimum recovery rate was

[201] San Francisco Planning Department, *Agreement for Disposal of San Francisco Municipal Solid Waste at Recology Hay Road Landfill in Solano County, Final Negative Declaration, Planning Department Case No. 2014.0653*, May 21, 2015, http://sfmea.sfplanning.org/2014.0653E_Revised_FND.pdf, accessed February 2, 2021.
[202] Department of Resources Recycling and Recovery (CalRecycle), Solid Waste Information System (SWIS) Facility Detail, Recology Hay Road, https://www2.calrecycle.ca.gov/SolidWaste/Site/Details/3582, accessed November 10, 2021

achieved. Projects of four or more occupied floors must recover at least 75 percent of total debris. Projects of four or fewer occupied floors must recover at least 65 percent of total debris.[203]

As previously noted, growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. In 2019, the target disposal rate for San Francisco residents and employees was 6.6 pounds per resident per day and 10.6 pounds per employee per day. Both of these target disposal rates were met in 2019 (the most recent year reported), with San Francisco generating about 3.8 pounds per resident per day and about 4.5 pounds per employee per day.[204] Therefore, subsequent projects that could occur pursuant to the Waterfront Plan would be anticipated to generate approximately 9,032 tons per year of solid waste that would necessitate disposal in a landfill.[205] As described above, the City is currently sending its solid waste to the Hay Road Landfill, which has operating capacity until 2041. Therefore, there is sufficient permitted capacity in the landfill to accommodate the solid waste that would be generated by subsequent projects that could occur pursuant to the Waterfront Plan. Given the City's progress to date on diversion and waste reduction, and given the existing future long-term capacity available at the Recology Hay Road Landfill and other area landfills, the subsequent projects that could occur with implementation of the Waterfront Plan would not generate solid waste in excess of state or local standards and would be served by regional landfills with sufficient permitted capacity to accommodate its solid waste disposal needs. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-UT-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts on utilities and service systems. ***(Less than Significant)***

The Plan area and the service territories of the utility providers serve as the geographical context for the cumulative impact analysis. Over time, growth in the Plan area and San Francisco as a whole would result in increased demand for a reliable water supply, wastewater treatment, solid waste disposal, electric power, natural gas, and telecommunications. According to ABAG projections, San Francisco is expected to gain approximately 101,000 households and 280,000 residents between 2010 and 2040 and have a population of more than 1 million, a 35 percent increase in residential population. Employment is forecast to increase by 34 percent (191,000 jobs) during this period to a total of approximately 760,000.[206] Citywide growth also would generate increased demand for utilities.

WATER SUPPLY

Other development would increase demands on water supplies as well as water infrastructure and treatment facilities. However, SFPUC has incorporated the demand from other development projects in its future water service projections. New or expanded water treatment facilities would not be required as a result of

[203] City and County of San Francisco Department of Building Inspection, Administrative Bulletin 093, Implementation of Green Building Regulations, effective January 1, 2020, https://codelibrary.amlegal.com/codes/san_francisco/latest/sf_building/0-0-0-95527, accessed May 24, 2021.
[204] California Department of Resource Recycling and Recovery, Jurisdiction Diversion/Disposal Rate Detail, 2019, https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006, accessed May 12, 2021.
[205] Calculation: 3.8 pounds/resident/day x 540 residents x 365 days/year = 748,980 pounds/year; converted into tons = 374 tons/year. For employees, 4.5 pounds/employee/day x 14,800 employees x 260 days/year = 17,316,000 pounds/year; converted into tons = 8,658 tons/year. Total: 375 tons/year for residents + 8,658 tons/year for employees = 9,032 tons/year.
[206] Association of Bay Area Governments and Metropolitan Transportation Commission, *Jobs-Housing Connection Strategy*, May 16, 2012, https://www.planbayarea.org/sites/default/files/pdf/JHCS/May_2012_Jobs_Housing_Connection_Strategy_Main_Report.pdf, accessed January 15, 2021.

implementation of the Waterfront Plan, and the contribution to water demand from subsequent projects that could occur pursuant to the Plan would not adversely affect the city's water supply. Therefore, cumulative impacts on the city's water supply would be ***less than significant***.

WASTEWATER

Citywide water demand is forecast to increase steadily through 2040. After accounting for the projected savings from conservation, retail water demand is projected to increase from 64.8 mgd in 2015 to 83.9 mgd in 2040.[207] This is an increase of 19.1 mgd, or 29 percent, compared with water use in 2015. Based on the projected citywide increase in water use, year-round citywide wastewater discharges to the combined sewer system would increase by about 18.1 mgd by 2040, assuming a 95 percent conversion factor.

As noted above, growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. The anticipated growth in the Plan area is conservatively estimated to increase the amount of water used. However, the related increase in wastewater flows would be less than any increase in water demand as a result of compliance with San Francisco's Non-Potable Water Program, LEED® standards, and California Building Code. Each of the cumulative projects, including subsequent projects that could occur pursuant to the Waterfront Plan, also would be required to implement erosion and sediment control plans, in compliance with the City's NPDES permits and regional board and USEPA regulations regarding wastewater treatment and discharge. Compliance with these regulations would minimize impacts from cumulative construction sediment and contaminants entering the combined sewer system. Although each cumulative project would result in increased wastewater flows, each large project creating or disturbing more than 5,000 square feet of impervious area also would be required to reduce stormwater flows by 25 percent compared with existing conditions. The 25 percent reduction (relative to the 2-year storm) in stormwater flows would result in an overall reduction in combined wastewater and stormwater flows. As a result, the cumulative projects would not combine with subsequent projects that could occur pursuant to the Waterfront Plan to generate a significant cumulative impact related to wastewater flows. Therefore, cumulative impacts related to wastewater would be ***less than significant***.

STORMWATER

Future development in the city outside of the Plan area would consist primarily of infill and redevelopment projects, which would not substantially increase the amount of impervious surfaces in the city. Existing regulations require new projects to adhere to the Stormwater Management Ordinance (ordinance 64-16). Development that would create or replace more than 5,000 square feet of impervious surface would be required to comply with the Construction Site Runoff Control Ordinance, which requires preparation of an erosion and sediment control plan or stormwater pollution prevention plan (SWPPP) and submittal of a Construction Site Runoff Control Permit Application. Furthermore, various infrastructure improvements to sewers and pump stations, as well as stormwater management projects in the Plan area and vicinity, would increase treatment or conveyance capacity. Therefore, cumulative impacts on the city's stormwater drainage facilities would be ***less than significant***.

[207] San Francisco Public Utilities Commission, *2015 Urban Water Management Plan for City and County of San Francisco*, https://sfpuc.org/about-us/policies-plans/urban-water-management-plan, accessed November 10, 2021.

SOLID WASTE

Long-range growth forecasts are considered in the City's planning for future landfill capacity, as described above. In 2018, the City updated its zero-waste goal to reduce municipal solid waste generation by 15 percent by 2030, and to reduce disposal to landfill and incineration by 50 percent by 2030.[208] Therefore, the City is expected to reduce solid waste volumes in the future. Cumulative projects, in combination with subsequent projects that could occur pursuant to the Waterfront Plan, would incrementally increase total waste generation from the city by increasing the number of residents as well as excavation, demolition, and remodeling activities associated with growth. However, the increasing rate of diversion citywide through recycling, composting, and other methods would result in a decreasing share of total waste that would require deposition into a landfill. As with subsequent projects that could occur with implementation of the Waterfront Plan, other development would be subject to the City's Mandatory Recycling and Composting Ordinance, which requires all San Francisco residents and commercial landlords to separate their refuse into recyclables, compostables, and trash, thereby minimizing solid waste disposal. Other development also would be subject to the San Francisco Green Building Code, which requires that 100 percent of construction waste must be taken by a registered transporter to a registered facility and processed for recycling. The code also requires that projects of four or more occupied floors must recover at least 75 percent of total debris, and projects of four or fewer occupied floors must recover at least 65 percent of total debris. Given the City's progress to date on diversion and waste reduction and given the future long-term capacity available at the Recology Hay Road Landfill and other area landfills, the subsequent projects that could occur pursuant to the Waterfront Plan would be served by a landfill with sufficient permitted capacity to accommodate its solid waste disposal needs. Therefore, cumulative related to solid waste would be ***less than significant***.

ELECTRIC POWER, NATURAL GAS, AND TELECOMMUNICATIONS

Future development in the city outside of the Plan area would consist primarily of infill and redevelopment projects, which would not substantially increase the amount of electric power, natural gas, and telecommunications required. Existing regulations require new projects to adhere to energy efficiency standards. All new development in the city would be required to comply with the standards of Title 24, the San Francisco Green Building Code, and the Port Green Building Code, thereby minimizing the amount and type of energy used. Subsequent projects in the Plan area would similarly need to comply with these standards. Therefore, cumulative impacts on the city's electric power, natural gas, and telecommunications facilities would be ***less than significant***.

Mitigation: None required.

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[208] SF Environment, Zero Waste – Frequently Asked Questions, https://sfenvironment.org/zero-waste-faqs, accessed February 2, 2021.

14. Public Services

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
14. PUBLIC SERVICES. Would the project:					
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 such as fire protection, police protection, schools, parks, or other public facilities?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

SAN FRANCISCO POLICE DEPARTMENT

The San Francisco Police Department (police department) provides emergency services and includes 10 stations within the city. The police department Central, Southern, and Bayview districts have jurisdiction over the entirety of the Plan area. Police stations within a mile of the waterfront include stations at 774 Vallejo Street serving the police department's Central district, 1251 Third Street serving the Southern District, and 201 Williams Avenue serving the Bayview District.

The Central District is bordered by the waterfront to the north and east, Larkin Street to the west, and by Geary and Mission streets to the South. The district includes Chinatown, North Beach, Fisherman's Wharf, Alcatraz Island, the Financial District, Telegraph Hill, Nob Hill and Russian Hill Neighborhoods. While the police department Tenderloin District does not have jurisdiction over the Plan area, it is within a mile of the waterfront and bordered to the west by Central and Southern districts, which do have jurisdiction over the Plan area. The Tenderloin District office is located at 301 Eddy Street.

The Southern District is bordered by Mission and the Central freeway to the east, South Beach and Mission Bay sections of the Port waterfront to the east, and Vernon and Mariposa streets to the south. The district includes the South Park, SoMa, Design District, Mission Bay, Potrero Hill, Dogpatch, Central Waterfront, and India Basin neighborhoods.

The Bayview District is the southernmost district in the Plan area and is bordered by Mariposa Street to the north, the Bayshore Boulevard and John McLaren Park to the east and India Basin, Hunters Point and Candlestick Point neighborhoods of the Southern Waterfront to the west. The police department is constructing a new 100,000-square-foot facility at 1995 Evans Street in the Bayview neighborhood. The new facility will host the police department's Traffic Company and Forensic Services Division.[209]

[209] San Francisco Public Works, Traffic Company and Forensic Services Division, https://sfpublicworks.org/traffic-company, accessed February 2, 2021.

SAN FRANCISCO FIRE DEPARTMENT

The San Francisco Fire Department (fire department), headquartered at 698 Second Street, provides fire suppression and emergency medical services in the city, including the Plan area. In addition, several privately operated ambulance companies are authorized to provide advanced life support services. The fire department consists of three divisions, which are subdivided into 10 battalions and 45 active stations throughout the city. Fire stations that serve the Plan area include Stations 51, 16, 28, 13, 35, 1, 8, 29, 25, 9, and 17. Fire Station 35 is located in the Plan area at Pier 22½, which serves fire emergency services in the Plan area and city, and is the location of the City's fireboat operations that serve the city and bay area region. The fire department's goal response times conform to the National Fire Protection Agency response times. The agency's First-Responder Total Unit response time is 5 minutes while Advanced Life Support Unit Total Response time is 9 minutes.

SAN FRANCISCO UNIFIED SCHOOL DISTRICT

The San Francisco Unified School District (school district) operates San Francisco's public schools. During the 2019-2020 academic year, the school district managed 130 schools (64 elementary schools, 13 middle schools, 14 high schools, 8 alternative schools, 11 charter schools, 12 early education schools, 5 county and court schools, and 3 continuation schools), with a total enrollment of 54,452.[210] The existing schools within the Plan's subareas are identified below.

NORTHEAST WATERFRONT SUBAREA

- Garfield Elementary School at 420 Filbert Street
- Chin Elementary School at 350 Broadway Street
- Edwin and Anita Lee Newcomer Elementary School (formerly the Chinese Education Center) at 657 Merchant Street
- Francisco Middle School at 2190 Powell Street

SOUTH BEACH SUBAREA

- Carmichael Citywide Elementary School at 824 Harrison Street
- Bessie Carmichael Pre-K and Elementary School at 375 Seventh Street

MISSION BAY AND THE SOUTHERN WATERFRONT SUBAREAS

- Webster Elementary at 465 Missouri Street
- Starr King Elementary at 1215 Carolina Street
- Malcom X Elementary at 350 Harbor Road
- San Francisco International High School at 655 De Haro Street
- Marshall High School at 45 Conkling Street
- Brown Middle School at 2055 Silver Avenue

[210] San Francisco Public Schools, Facts at A Glance 2020, https://drive.google.com/file/d/1Pwkg7tRp6X8_BffhusGdzeZOTPAWijxW/view, accessed February 2, 2021.

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Plan to reflect revised or new goals, policies, and procedures and would amend the planning code to create Waterfront SUD 4. Effects on population and housing could result as subsequent projects that could occur pursuant to the Waterfront Plan could add new residential and commercial, maritime, or mixed-use projects on undeveloped seawall lots and piers.

Growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. Therefore, effects on public services systems could result as subsequent projects that could occur pursuant to the Waterfront Plan introduce new businesses, housing, and population to the Plan area.

IMPACTS AND MITIGATION MEASURES

Impact PS-1: The Waterfront Plan would increase the demand for police service or fire protection service but not to such an extent that construction of new or physically altered facilities would be required. ***(Less than Significant)***

POLICE PROTECTION

Subsequent projects that could occur pursuant to the Waterfront Plan could result in increased demand for police services as a result of increases in residential and employment population in the Plan area. However, as previously discussed, the Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur in regional growth forecasts.

The police department recognizes the need to expand some facilities as the population of the city increases. Collectively, these efforts, which are not specifically in response to the Waterfront Plan, are designed to respond to the needs of the city on a program-wide basis and ensure that adequate response times and distributions for police officers are achieved.

The police department will continue to evaluate its performance, based on response times and, when appropriate, reallocate resources to meet the need for services in specific parts of the city if and when conditions warrant. Although subsequent projects that could occur with implementation of the Waterfront Plan would increase the resident and daytime population in the Plan area, it would not result in unplanned population growth. As discussed in Section E.3, Population and Housing, the population and housing generated by implementation of the Waterfront Plan would fall within ABAG projections for the city; therefore, this growth has already been factored into police department forecasts, and the police department would increase staffing accordingly. As such, subsequent projects that could occur pursuant to the Waterfront Plan would not necessitate the construction of new or expanded police department facilities to maintain acceptable service ratios, response times, or other performance objectives. Therefore, this impact would be ***less than significant***.

FIRE PROTECTION

Subsequent projects that could occur pursuant to the Waterfront Plan could result in increased demand for fire protection services as a result of increases in residential and employment population in the Plan area. However, as noted above, the Waterfront Plan would not stimulate population or job growth within the city that is not already projected to occur in regional growth forecasts.

In addition, as noted above, the Plan area is served by numerous fire stations. The fire department conducts ongoing assessments of its service capacity and response times and would continue to do so in response to projected growth within the Plan area and citywide over the lifetime of the Waterfront Plan. As discussed above and in Section E.3, Population and Housing, the population and housing generated by implementation of the Waterfront Plan would fall within ABAG projections for the city; therefore, this growth has already been factored into fire department forecasts, and the fire department would increase staffing accordingly. As such, subsequent projects that could occur pursuant to the Waterfront Plan would not necessitate the construction of new or expanded fire department facilities to maintain acceptable service ratios, response times, or other performance objectives. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact PS-2: The Waterfront Plan would not directly or indirectly generate school students and increase enrollment in public schools such that new or physically altered facilities would be required. ***(Less than Significant)***

Implementation of the Waterfront Plan could result in residential development that would generate students who could attend San Francisco public schools. With implementation of the Waterfront Plan, approximately 260 residential units could be constructed in the Plan area.

The Leroy F. Greene School Facilities Act of 1998, or SB 50, authorizes school districts to levy developer fees to finance the construction or reconstruction of school facilities. These fees are intended to address increased educational demands on the school district resulting from new development. Public school districts can, however, impose higher fees than those established by the State Allocation Board, provided they meet the conditions outlined in the act. Private schools are not eligible for fees collected, pursuant to SB 50. Local jurisdictions are precluded under state law (SB 50) from imposing enrollment-related mitigation beyond the school impact fees. These development impact fees are distinct from mitigation under the environmental review process.

To analyze the demand on schools resulting from implementation of the Waterfront Plan, estimates of the number of students generated by new residential development that could occur in the Plan area were made using public school student generation rates for market-rate units based on analysis prepared for the school district. **Table 3** identifies the number of school-aged children expected to attend school district facilities that would be generated by residential development that could occur pursuant to the Waterfront Plan.

Table 3 Public School Students Generated by the Waterfront Plan

Type of Unit	Total Units	Student Generation Rate	Estimated Student Growth
Market-Rate Units	260	0.05	13

SOURCE: Lapkoff & Gobalet Demographics Research, Inc., *Demographic Analyses and Enrollment Forecasts, San Francisco Unified School District*, January 2020, https://drive.google.com/file/d/1GVnFHp3wJKv8gx74u6BydA3OiG0JKTb5/view, accessed November 10, 2021.

Overall, residential development that could occur pursuant to the Waterfront Plan would add approximately 13 students to the Plan area. It is conservatively assumed that students would be new to the district and would attend public schools, though it is likely that a portion of the students would already be enrolled within the

school district or would attend a private school. Presently, families list their preferred schools, which can include any school in the district with capacity. However, in an effort to develop a more equitable, effective, and accessible student assignment system, the school district is planning to re-draw elementary school attendance areas to maximize socioeconomic diversity, limit extensive selection options, and prioritize sending students to school closer to their homes. The new elementary school student assignment system will be a zone-based system in effect for applications for the 2024-2025 school year. Thus, it is not assumed that all students generated by subsequent projects would attend the nearest school in the near term, but that will change for elementary school students. The potential 13 additional K–12 students that could result from subsequent projects pursuant to the Waterfront Plan represent an increase of approximately 0.03 percent in district enrollment compared with the 2019–2020 academic year.

According to a facilities survey, the school district has capacity for approximately 63,400 students. Student enrollment as of fall 2019 was approximately 54,452 students, with an expected enrollment increase to 64,000 to 73,000 by 2030.[211] Given the school district's overall capacity, the increase of 13 students associated with subsequent projects that could occur pursuant to the Waterfront Plan would contribute to the overall demand for schools but would not result in the need for new or physically altered facilities. Although subsequent projects could increase the resident population and incrementally increase the potential student enrollment in the school district, there is adequate capacity in the school district system to accommodate the anticipated 13 new students generated by subsequent projects that could occur pursuant to the Plan. Therefore, subsequent projects that could occur pursuant to the Waterfront Plan would not necessitate the need for new school facilities or the physical alteration of existing school facilities and the impact would be ***less than significant***.

Mitigation: None required.

Impact C-PS-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts on police, fire, and school district services such that new or physically altered facilities, the construction of which could cause significant environmental impacts, would be required in order to maintain acceptable levels of service. ***(Less than Significant)***

Population and employment growth associated with implementation of other development projects in the city would increase the number of service calls and could create a need for additional facilities to maintain existing police department service levels. On June 23, 2015, the board of supervisors passed Resolution No. 248-15, which increased the mandated minimum staffing level to 2,200 sworn officers.[212] This increase would bring the voter-approved minimum into line with San Francisco's current population.[213] Furthermore, police boundaries are required to be analyzed every 10 years, with consideration given to workload, district boundaries, response times, and facilities, per the board of supervisors legislation (Ordinance 243-06).[214] The latest analysis of police boundaries was conducted in 2015. The 2015 District Station Boundary Analysis Report addressed issues related to the impact of a significant number of residential, commercial, and transportation

[211] San Francisco Unified School District, Growing Population, Growing Schools. SPUR Forum Presentation, Slide 14, dated August 31, 2016, https://www.spur.org/sites/default/files/events_pdfs/SPUR%20Forum_August%2031%202016.pptx_.pdf, accessed February 2, 2021.
[212] San Francisco Board of Supervisors, Resolution No. 248-15, Establishing a Population-Based Police Staffing Policy, June 23, 2015, http://sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions15/r0248-15.pdf, accessed February 2, 2021.
[213] Ibid.
[214] San Francisco Board of Supervisors, Ordinance No. 243-06, Boundaries of Police Department District Station, August 7, 2006, http://sfbos.org/ftp/uploadedfiles/bdsupvrs/ordinances06/o0243-06.pdf, accessed February 2, 2021.

developments in the eastern and southern areas within the city.[215] The increase in the minimum level of sworn officers and the analysis of police boundaries were designed to respond to the needs of the city on a program-wide basis and ensure that adequate response times and distributions of police officers would be achieved. Cumulative development in the project area may incrementally increase demand for police services but not beyond levels anticipated and planned for by police department. For these reasons, subsequent projects that could occur pursuant to the Waterfront Plan, in combination with cumulative projects, would not result in the need for new or physically altered police facilities in order to maintain acceptable service ratios. The impact would be ***less than significant***.

Development that could occur pursuant to the Waterfront Plan would add to the demand for fire response and emergency medical services. However, the fire department has not identified a citywide service gap. As noted above, the fire department conducts ongoing assessments of its service capacity and response times and would continue to do so in response to projected growth within the Plan area and citywide over the lifetime of the Waterfront Plan. Therefore, the Waterfront Plan, in combination with cumulative projects, would not necessitate the need for new or physically altered fire and emergency medical service facilities in order to maintain acceptable service ratios, and the impact would be ***less than significant***.

The school district has plans to develop a school in Mission Bay.[216] Based on anticipated population and housing growth under 2040 conditions, the school district will likely need new or expanded public school facilities, the construction or renovation of which could result in significant environmental impacts related to construction. However, the specific plans and locations for such facilities besides the Mission Bay School are unknown at this time and would be required to undergo environmental review with the school district as lead agency. Based on an understanding of similar development, these types of construction impacts could likely be mitigated. Regardless, the subsequent projects that could occur pursuant to the Waterfront Plan could generate approximately 13 students. This potential increase in public school population as a result of implementation of the Waterfront Plan, in combination with cumulative projects and the school district's new student assignment policy, could result in a significant cumulative impact related to the need for a new school facility, construction of which could cause significant environmental impacts. However, the 13 students generated under the Waterfront Plan would not constitute a considerable contribution to a significant cumulative impact for the need for new or physically altered school facilities. Therefore, the impact would be ***less than significant***.

Mitigation: None required.

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[215] Public Safety Strategy Group, LLC., *District Station Boundary Analysis Report*, March 3, 2015, http://docs.ppsmixeduse.com/ppp/DEIR_References/2015_0303_publicsafety_districtboundaryanalysis.pdf, accessed February 2, 2021.
[216] San Francisco Unified School District. 2021. A School for a Growing City: Mission Bay School Updates regarding Draft EIR publication, https://www.sfusd.edu/schools/schools-community/school-mission-bay, accessed October 21, 2021.

15. Biological Resources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
15. BIOLOGICAL RESOURCES. Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☒	☐	☐	☐	☐
c) Have a substantial adverse effect on 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 the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐	☐

Implementation of the Waterfront Plan could have the potential to result in significant impacts related to biological resources; therefore, this topic is further analyzed in Draft EIR Section 4.F, Biological Resources.

16. Geology and Soils

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
16. GEOLOGY AND SOILS. Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐	☐
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 waste water?	☐	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐	☐

The Waterfront Plan would not immediately result in new development. Wastewater generated by subsequent projects that could occur pursuant to the Plan would be routed to the combined sewer system, which is the wastewater conveyance system for the city and would not use septic tanks or other on-site land disposal systems for sanitary sewage. Therefore, topic E.16(e) is not applicable.

The Plan area is located along the San Francisco waterfront where the topography is characterized by relatively gentle slopes. This area is mapped as "flatland" by the United States Geological Survey[217] and there are no

[217] United States Geological Survey, *Summary Distribution of Slides and Earth Flows in the San Francisco County, California*, Open File Report 97-745 Part C, by C.M. Wentworth, S.E. Graham, R.J. Pike, G.S. Beukelman, D.W. Ramsey, and A.D. Barron, 1997, https://pubs.usgs.gov/of/1997/of97-745/sf-sef.pdf, accessed on February 2, 2021.

zones of potential earthquake-induced landslides mapped along the waterfront under California's Seismic Hazards Mapping Act of 1990.[218] Therefore, there is no impact regarding topic E.16(a)(iv).

This section describes the Plan area's geology, soils, and seismic hazard characteristics based on maps prepared by the state and on information and findings provided in reports prepared for previous projects along San Francisco's eastern shoreline.

ENVIRONMENTAL SETTING

The Plan area encompasses generally gently eastward sloping to flat areas along the eastern waterfront of San Francisco that were open water prior to being artificially filled during the 19th and 20th centuries. The depth and composition of artificial fill varies along the waterfront, but the fill generally overlies Young Bay Mud (compressible mud deposited recently in the San Francisco Bay) in all locations along the project area. The Young Bay Mud thickness underlying the artificial fill generally increases away from the historic shoreline.

The subsurface along the northern waterfront subareas from approximately Oracle Park to Fisherman's Wharf is highly varied. Underlying artificial fill, varying thicknesses of Young Bay Mud or sand overlie either upper layered sediments (interbedded sand and clay) or Franciscan sandstone and shale bedrock. The depth to bedrock also varies widely along this portion of the Plan area, from approximately 50 feet below ground level to nearly 200 feet below ground level.[219]

In the Mission Bay subarea, artificial fill is underlain by Young Bay Mud, sandy alluvium, and stiff marine Old Bay Clay that overlays the Franciscan bedrock located at depths ranging from 30 to 130 feet below sea level.[220] Current data indicates that the Young Bay Mud deposits are late Pleistocene to middle Holocene in age, while the Old Bay Clay is Pleistocene in age.[221]

In the Southern Waterfront subarea around Potrero Point, thinner layers of artificial fill are underlain by Jurassic-age serpentinite bedrock of the Franciscan Complex. This bedrock also forms part of a gentle northwest-southeast trending ridge that was quarried and covered by fill during development of the eastern San Francisco waterfront. The serpentinite component of the Franciscan Complex is mostly sheared and highly fractured rock.

Farther south in the Plan area, a regulated landfill is within the Piers 90–94 Backlands, underlying the northern portion of the Pier 94 staging areas.[222] The landfill is covered with a soil cap consisting of 2.5 to 8 feet of loose to very dense sands and gravels with variable amounts of clay and silt, and occasional concrete, brick, and serpentinite fragments. The cap is underlain by construction debris and municipal waste, dredge spoils that were placed before the landfill began operation, and clay.

Major active earthquake fault zones in the area are the North San Andreas, San Gregorio, Hayward, and Calaveras fault zones. Of these, the North San Andreas, Hayward, and Calaveras fault zones all have a 25 percent or greater likelihood of experiencing a magnitude 6.7 or greater earthquake between 2014 and

[218] California Division of Mines and Geology, Seismic Hazard Zones, San Francisco Quadrangle, California Division of Mines and Geology, Official Map, effective November 17, 2000, http://gmw.consrv.ca.gov/shmp/download/quad/SAN_FRANCISCO_NORTH/maps/ozn_sf.pdf, accessed February 2, 2021; San Francisco Planning Department, *Community Safety An Element of the General Plan of the City and County of San Francisco*, October 2012.
[219] CH2M and Arcadis, *Port of San Francisco Waterfront Resilience Program Multi-Hazard Risk Assessment Northern Waterfront and Embarcadero Seawall Summary Report*, prepared for Port of San Francisco, August 2020.
[220] San Francisco Planning Department, *Event Center and Mixed-Use Development at Mission Bay Blocks 29–32, Environmental Impact Report*.
[221] Margaret Clair Parks, Engineering Properties and Geologic Setting of Old Bay Clay Deposits, Downtown San Francisco, California, Summer 2019.
[222] Treadwell & Rollo/RYGC, a Joint Venture, *Geotechnical Investigation, Pier 94 Backland Improvements, San Francisco, California*, July 5, 2012.

2043. Overall, there is a 72 percent likelihood of an earthquake of magnitude 6.7 or greater occurring in the San Francisco Bay Area over the same period.

A majority of the Plan area would experience very strong to violent shaking during a large earthquake along any one of the surrounding faults.[223] Except for the finger piers and a portion of Crane Cove Park in the Southern Waterfront subarea, the Plan area is also mapped as within a liquefaction hazard zone, due to the presence of unconsolidated artificial fill or sandy sediment layers.[224] The presence of very thick Young Bay Mud and shallow liquefiable sand along portions of the Plan area increase the potential for lateral displacement during an earthquake.[225]

Terrestrial sedimentary deposits underlying the Plan area that are Pleistocene age or older have the potential to contain unique paleontological resources.

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. The Plan also would amend the planning code to create the Waterfront SUD 4, which would require waterfront design review process and procedures for future development on Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs.

The planning department considers whether a project would be located in an area that is subject to surface fault rupture of a known earthquake fault or strong seismic ground shaking, as mapped by the California Geologic Survey or presented in other substantial evidence. However, in the *California Building Industry Association v. Bay Area Air Quality Management District* case that was decided in 2015, the California Supreme Court held that CEQA does not generally require lead agencies to consider how existing hazards or conditions might affect a project's users or residents, except when the project would exacerbate an existing environmental hazard. Accordingly, hazards resulting from a project that places development in an area subject to surface fault rupture or seismic ground shaking are not considered impacts under CEQA, unless the project would exacerbate a seismic hazard.

Although the Waterfront Plan would not exacerbate seismic hazards, the discussion below provides information regarding exposure to increased risks associated with surface fault rupture and strong seismic ground shaking.

To identify impacts on paleontological resources, the paleontological sensitivity of geologic units present within the Waterfront Plan area was identified. Paleontological sensitivity is an indicator of the likelihood of a geologic unit to yield fossils.[226]

The fossil-yielding potential of geologic units in a particular area depends on the geologic age and origin of the units as well as the processes undergone, both geologic and anthropogenic.[227] The potential for a

[223] San Francisco Planning Department, *Community Safety: An Element of the General Plan of the City and County of San Francisco*, October 2012.
[224] Ibid.
[225] CH2M and Arcadis, *Port of San Francisco Waterfront Resilience Program Multi-Hazard Risk Assessment Northern Waterfront and Embarcadero Seawall Summary Report*, Prepared for Port of San Francisco, August 2020.
[226] Society of Vertebrate Paleontology, *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*, 2010, https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines.pdf, accessed February 2, 2021.
[227] *Anthropogenic* means caused by human activity.

subsequent project to affect paleontological resources is related to ground disturbance, which would then take place during a project's construction.

In consultation with Paleo Solutions, Inc., the City of San Francisco utilizes the Potential Fossil Yield Classification (PFYC) system as modified from the system developed and refined by the BLM (2007, 2016) as the basis for its paleontological potential designations. The PFYC system is a predictive resource-management tool founded on two basic facts of paleontology: that occurrences of paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them, and that the likelihood of the presence of fossils can be broadly predicted from the distribution of geologic units at or near the surface. Therefore, geologic mapping, as the documentation of geologic unit distribution, is a reliable method for assessing the potential of geologic units to preserve fossils.

The paleontological potential designations classify soil potential from very low potential to very high potential. The class designations for the City of San Francisco are numbered on a scale of one to three (i.e., Class 1 to 3) and the higher the class number, the greater the potential that significant fossils may be present. The higher classes, Class 4 (high potential) and Class 5 (very high potential), which include geologic units that contain a high occurrence of paleontological resources, are not included in the table below because the type of geologic units were not identified as being present within the City of San Francisco, based on currently available data.

Table 4 presents the City's PFYC system.

Measures for adequate protection or salvage of significant paleontological resources are applied to areas determined to contain geologic units with moderate potential to contain unique paleontological resources. In areas determined to have moderate potential for unique paleontological resources, an adequate program for reducing the impact of development must include specific conditions, such as worker awareness training, procedures to be followed in the case of accidental discovery, surveying; monitoring by a qualified paleontological resource monitor; salvaging, identifying, cataloging, curating, and providing repository storage; and reporting.

The planning department evaluates impacts under CEQA in accordance with CEQA, the CEQA Guidelines (the guidelines), and Chapter 31 of the San Francisco Administrative Code. Public Resources Code section 21084 includes a list of projects that are exempt from the provisions of CEQA because they are determined not to result in a significant effect on the environment. A project determined to be eligible for a categorical exemption would not require further evaluation of paleontological resource impacts.

As part of the environmental review process, the planning department conducts paleontological resource analysis, as applicable. First, the planning department determines whether a project is eligible for a categorical exemption. If so, then there is no further paleontology evaluation. If not, then the planning department determines whether a project's construction activities would result in soil disturbance of more than 5 feet in depth and more than 2,500 cubic yards in volume. If not, then no further evaluation of paleontology impacts is needed. Otherwise, the planning department assesses if there are geologic units with moderate sensitivity to yield unique paleontological resources present at the site that have not previously been disturbed. If so, the planning department then determines if the project's construction activities and subsurface disturbance at the site have the potential to affect the sediments with moderate paleontological sensitivity. If so, the project could have a significant impact on a unique paleontological resource and mitigation is required.

Mitigation would include either procedures to be followed for unanticipated discovery or development of a construction monitoring program for construction activities with the potential to affect moderately sensitive geologic units. Documentation and reporting of monitoring activities and any paleontology resource finds by a paleontological consultant may be required.

Table 4 Paleontological Potential Located in City of San Francisco

Paleontological Potential Designation	Assignment Criteria Guidelines and Impact Reduction Summary	Geologic Units Classifications for City of San Francisco
Class 1 = Very Low Potential	Geologic units (Precambrian Age) are not likely to contain recognizable paleontological resources. Units are igneous or metamorphic, excluding air-fall and reworked volcanic ash.	Igneous rocks (not generally encountered in San Francisco)
	Potential for significant paleontological resource impact is usually negligible, and impact reduction requirement is unnecessary except in rare or isolated circumstances.	
Class 2 = Low Potential	Geologic units (younger than 10,000 years before present, recent aeolian deposits) are not likely to contain paleontological resources. Fossil preservation unlikely.	Holocene-age surficial deposits and Franciscan Complex (encountered in San Francisco)
	Potential for significant paleontological resource impact is generally low, and impact reduction requirement is usually unnecessary except in rare or isolated circumstances.	
Class 3 = Moderate Potential	Sedimentary geologic units (Marine in origin) where fossil content varies in significance, abundance, and predictable occurrence. Scattered occurrences.	Pleistocene-age surficial deposits, Colma Formation, Merced Formation (encountered in San Francisco)
	Potential for significant paleontological resource impact is moderate. Impact reduction options could include record searches, pre-disturbance surveys, monitoring, mitigation, or avoidance. A preconstruction study may be required.	
Class U = Unknown Potential	Geologic units that cannot receive an informed class assignment or have not been studied in detail; reports of finds are anecdotal and unverified.	Holocene- to Pleistocene-age surficial deposits (specific age not known)
	Geological units may exhibit features or preservation conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is known.	
	There is no information on the age of the unit. In San Francisco, this applies to units that are listed as being Holocene to Pleistocene. Holocene-age sediments are generally considered too young to contain in situ fossils. Pleistocene-age sediments have produced Ice Age fossils in San Francisco. As noted above, most units in San Francisco are identified as Class U.	
	Due to the unknown sensitivity potential a review of geotechnical report and spot-checking during ground disturbing activities may be necessary.	

SOURCE: Modified from BLM, *Potential Fossil Yield Classification (PFYC) System for Paleontological Resources on Public Lands*, 2016.

IMPACTS AND MITIGATION MEASURES

Impact GE-1: The Waterfront Plan would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, strong seismic ground shaking, or seismically induced ground failure. ***(Less than Significant)***

FAULT RUPTURE

Fault rupture almost always follows pre-existing faults, which are zones of weakness. Surface rupture occurs when movement on a fault deep within the earth breaks through to the ground surface. There is a very low potential for fault rupture within the Plan area because no active faults cross the site. The plan area is not located within an Alquist-Priolo Earthquake Fault Zone or traversed by an active fault; therefore, impacts related to fault rupture would be ***less than significant***.

GROUND SHAKING

Like the rest of the San Francisco Bay Area, the Plan area would be subject to ground shaking in the event of an earthquake on one of the regional faults. The intensity of the seismic shaking, or strong ground motion, in the Plan area would be dependent on the distance between the Plan area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the plan area. Earthquakes occurring on faults closest to the Plan area would most likely generate the largest ground motions. The intensity of earthquake-induced ground motions can be described in terms of peak ground acceleration, which is represented as a fraction of the acceleration of gravity (g).[228]

The United States Geological Survey estimates that it is nearly certain that a magnitude 6.7 or higher earthquake will occur on one of the California regional faults in the 30-year period between 2014 and 2044, with a 72 percent likelihood in the San Francisco Region.[229] The Plan area could be subject to very strong to violent ground shaking due to an earthquake along the Hayward Fault or the Peninsula segment of the San Andreas Fault.[230] The mapped Risk-Targeted Maximum Credible Earthquake geometric mean peak ground acceleration in the plan area is 0.53 times gravitational acceleration.

The structural design of any subsequent projects pursuant to the Waterfront Plan would be developed using information obtained from the site-specific geotechnical investigation reports prepared by qualified, state-licensed engineers in accordance with chapters 16 and 18 of the San Francisco and Port of San Francisco building codes, which specify that every structure "shall be designed and constructed to resist the effects of earthquake motions."[231] The structural design requirements for the buildings would be based on the seismic design category and site class of each building, and determined in accordance with the procedures specified in chapter 16 of the building codes. In addition to building code requirements, subsequent projects would be reviewed by Port staff managing the Waterfront Resilience Program so that seismic retrofit and engineering measures anticipate and are well-coordinated with resilience requirements associated with providing flood and sea-level rise protection of the waterfront and city, and resilience policies and criteria of regional, state and federal agencies including the

[228] Acceleration of gravity (g) = 980 centimeters per second squared. 1.0 g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.
[229] United States Geological Survey and United States Department of the Interior, UCERF3: A New Earthquake Forecast for California's Complex Fault System, Fact Sheet 2015-3009, March 2015.
[230] San Francisco Planning Department, *Community Safety: An Element of the General Plan of the City and County of San Francisco*, October 2012.
[231] The Port Engineering Division Building Permit Group reviews building plans for the entire plan area except blocks between 26th and 22nd Streets in the Southern Waterfront subarea, blocks between 16th and Fourth Streets in the Mission Bay subarea, the western corner of the block inland of Piers 30–32, and a portion of the block inland of Pier 33.

San Francisco Bay Conservation and Development Commission, and the U.S. Army Corps of Engineers. The Waterfront Plan also introduces a new Resilience goal that includes policies to reduce seismic and life safety risks (Policy 2a), promote seismic retrofit and repairs to the Embarcadero Seawall and Port facilities (Policies 2b and c), and a program of resilience planning that is transparent and accountable to public review and engagement to adapt waterfront risks, conditions and priorities over time (Policies 4a–h).

Subsequent projects in the Plan area would not expose people or structures to substantial adverse effects related to ground shaking because the structures would be designed and constructed in accordance with the most current San Francisco and Port of San Francisco building codes, which consist of the state building code with local amendments.

Under section 1803 of the building codes, a site-specific geotechnical investigation, where required, must provide information about geotechnical hazards to be addressed in the project's design. As specified in section 1803.6, the geotechnical report shall include, but need not be limited to, the following information:

- A plot showing the location of the soil investigations
- A complete record of the soil boring and penetration test logs and soil samples
- A record of the soil profile
- Elevation of the water table, if encountered
- Recommendations for foundation type and design criteria, including but not limited to: bearing capacity of natural or compacted soil; provisions to mitigate the effects of expansive soils; mitigation of the effects of liquefaction, differential settlement and varying soils strengths; and the effects of adjacent loads.
- Expected total and differential settlement
- Deep foundation information in accordance with section 1803.5.5.
- Special design and construction provisions for foundations of structures founded on expansive soils, as necessary
- Compacted fill material properties in accordance with section 1803.5.8.
- Controlled low-strength material properties in accordance with section 1803.5.9.

Recommendations must be included in the geotechnical investigation report for the appropriate foundation type, structural systems, ground stabilization, or any combination of these to address the effects of liquefaction and related phenomena. The recommendations of the geotechnical report that address such hazards must be incorporated into the design of proposed structures.

Therefore, impacts related to ground shaking would be ***less than significant***.

LIQUEFACTION AND LATERAL SPREADING, AND SEISMIC SETTLEMENT

Liquefaction is a phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong ground shaking. Liquefaction-related phenomena include earthquake-induced settlement and lateral spreading. The susceptibility of a site to liquefaction and related effects is a function of the depth, density, and water content of the granular sediments at the site in relation to the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are most susceptible to these effects.

Section 1803.6 of the San Francisco and Port of San Francisco building codes (discussed above) would require that the site-specific geotechnical reports prepared for subsequent projects in the Plan area address the potential for liquefaction in accordance with the guidelines provided in Special Publication 117A of the California Department of Conservation. Building codes section 1803.5.12 provides further specifications for determining the potential for liquefaction and related hazards and assessing the potential consequences, such as total and differential settlement, lateral soil movement, lateral soil loads on foundations, and reductions in the load-bearing capacity of the soil. Measures to address the effects of liquefaction must be recommended in the site-specific geotechnical reports and incorporated into the conditions of permit(s) issued for the sites. Such measures must address the appropriate foundation type and depths and selection of the appropriate structural systems to accommodate anticipated ground displacements and forces. If ground stabilization is used, the foundation and structural design would be based on stabilized conditions.

Subsequent projects constructed pursuant to the Waterfront Plan would be supported on foundations determined appropriate by site-specific geotechnical investigations and designed in accordance with the building codes. Individual development sites may require soil improvement, based on site conditions. Construction documents specifying the structural design, including the type of foundation, would be reviewed by the San Francisco Department of Building Inspection (building department) or the Port Engineering Division Building Permit Group for conformance with recommendations in the geotechnical report during review of the building permits. Soils that could liquefy or experience earthquake-induced settlement would be removed during construction and/or soil improvement techniques would be implemented in conjunction with development of the structural foundation design. Removal of potentially liquefiable materials and/or implementation of soil improvement techniques, along with appropriate foundation designs, would reduce the potential for settlement within building footprints. However, adjacent streets and unimproved properties may experience settlement, which could affect utilities and surface improvements such as sidewalks. As noted above, subsequent projects also would be reviewed by Port staff managing the Waterfront Resilience Program so that the engineering measures to reduce or avoid geotechnical liquefaction risk also anticipate and are well-coordinated with resilience requirements associated with providing flood and sea-level rise protection of the waterfront and city, in coordination with resilience policies and criteria of regional, state, and federal agencies, including the BCDC, and the U.S. Army Corps of Engineers.

Appropriate design of subsequent projects in accordance with the recommendations of the site-specific geotechnical reports and in compliance with requirements of applicable building codes would ensure that impacts related to liquefaction and earthquake-induced settlement would be ***less than significant***.

Because subsequent projects would incorporate recommendations identified in site-specific geotechnical investigations required in accordance with chapter 16 and section 1803.7 of the San Francisco and Port of San Francisco building codes, as described above, the Waterfront Plan would not exacerbate the potential for people or structures to be exposed to substantial adverse effects associated with seismic hazards, including fault rupture, seismic ground shaking, liquefaction and seismically induced ground failure, or seismically induced lateral spreading. In addition, the Waterfront Plan would not exacerbate existing or future seismic hazards. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact GE-2: The Waterfront Plan would not result in substantial erosion or loss of topsoil. ***(Less than Significant)***

Soils in the Plan area are mapped as Urban land-Orthents, reclaimed complex, 0 to 2 percent slopes.[232] Urban land-Orthents are comprised of artificial fill overlying historic open water or tidal flats. The Plan area is urbanized and previous construction would have either removed or the area never included any topsoil (a fertile soil horizon that typically contains a seed base). Therefore, there would be ***no impact*** related to loss of topsoil.

Soil movement for subsequent projects could create the potential for wind- and water-borne soil erosion. However, all construction sites in San Francisco must implement best management practices for sediment and erosion control in accordance with article 4.2 of the San Francisco Public Works Code and the General Construction Stormwater Permit to reduce the impact of runoff from the construction site. SFPUC must review and approve the erosion and sediment control plan completed in accordance with article 4.2 prior to implementation, and would conduct periodic inspections throughout construction to ensure compliance with the plan. Once development occurs, the Plan area would be occupied by buildings or covered with pavement or landscaped areas, and runoff would drain to either the existing combined sewer system or through a separate storm sewer system, or infiltrate in landscaped areas or other features designed for stormwater runoff control pursuant to the City's stormwater management ordinance. Therefore, impacts related to soil erosion would be ***less than significant*** through compliance with applicable regulations.

Mitigation: None required.

Impact GE-3: The Waterfront Plan would not be located on a geologic unit or soil that is unstable, or that could become unstable as a result of implementation of the Plan. ***(Less than Significant)***

Construction of subsequent projects pursuant to the Waterfront Plan could induce ground settlement as a result of excavation, construction dewatering, and heave during installation of piles. As discussed above, the Port building codes would require a site-specific geotechnical report for each subsequent project. The geotechnical report would be reviewed by the Port Engineering Division Building Permit Group to ensure that it contains the required information specified in building codes section 1803.6 (listed under Impact GE-1). The geotechnical report would specify expected total and differential settlement, among other requirements.

During excavation of subsequent projects, the underlying artificial fill, Young Bay Mud, alluvium, and old bay mud underlying areas adjacent to the excavation area could become unstable, potentially causing settlement of adjacent structures, including buildings, sidewalks, streets, and utilities. In accordance with the California Building Code and local building codes, shoring would be required to prevent the subsurface earth materials from becoming unstable. The engineer of record would be responsible for monitoring during excavation. The final building plans would be reviewed by the Port Engineering Division Building Permit Group for conformance with recommendations in the site-specific geotechnical report.

Groundwater is, on average, approximately at sea level in the Plan area, and therefore excavations in landward portions of the Plan area during construction are likely to encounter groundwater. Excavations that would extend below the groundwater level would require dewatering to maintain a dry work environment and firm

[232] Natural Resources Conservation Service, Soil Map – San Mateo County, Eastern Part, and San Francisco County, California, https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm, accessed February 2, 2021.

subgrade for preparation of foundation construction. A water-tight shoring system could be used during excavation for structures, and dewatering excavation for the installation of utilities or the compaction of soil is expected to be required.

With implementation of the recommendations in the project-specific detailed geotechnical studies for subsequent projects that could occur with implementation of the Waterfront Plan, impacts related to the potential for settlement and subsidence due to excavation in soil that is unstable, or could become unstable as a result of such construction, would be ***less than significant***.

Mitigation: None required.

Impact GE-4: The Waterfront Plan would not create substantial risks to life or property as a result of locating buildings or other features on expansive soils. ***(Less than Significant)***

Expansive soils are typically very fine grained with a high percentage of clay and can damage structures and buried utilities and increase maintenance requirements. Expansive soils expand and contract in response to changes in soil moisture, most notably when nearby surface soils change from saturated to a low-moisture content condition and back again. The artificial fill along the San Francisco waterfront varies by location and can contain relocated dune sand, crushed local bedrock, building and construction debris, and dredge spoils, which could include some expansive clay.[233] The Young Bay Mud underlying the artificial fill is below the water table and is permanently saturated; therefore, it would not be subject to moisture changes that would cause expansion and contraction. Further, any backfill materials used for subsequent projects that could occur pursuant to the Waterfront Plan would have a low expansion potential and would be adequately compacted in accordance with the recommendations of the geotechnical reports prepared for the projects. Therefore, impacts related to expansive soils would be ***less than significant***.

Mitigation: None required.

Impact GE-5: The Waterfront Plan would not directly or indirectly destroy a unique geologic feature. ***(No Impact)***

A unique geologic or physical feature embodies distinctive characteristics of regional or local geologic principles, provides a key piece of information important to geologic history, contains minerals not known to occur elsewhere in the county, and/or is used as a teaching tool. No unique geologic features exist in the Plan area; therefore, no impacts on unique geological features would occur. The general topography of the area would remain the same. With respect to unique geologic features and topography, there would be no impact; therefore, this topic is not discussed further.

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[233] Hicock, Christopher, Givler, Robert, De Pascale, Greg, and Ranon Dulberg, William Lettis & Associates, Inc., *Detailed Mapping of Artificial Fills, San Francisco Bay Area*, September 2008.

Impact GE-6: The Waterfront Plan could directly or indirectly destroy a unique paleontological resource or site. ***(Less than Significant with Mitigation)***

Sediments that are dated to the late Holocene and younger (approximately 5,000 years before present to recent) are considered to be too young to contain fossil remains due to the amount of time required for remains to fossilize. Accordingly, Holocene-age sedimentary deposits generally have a very low potential to contain unique paleontological resources at the surface, but that potential increases with increased depth into the subsurface. Deposits that are dated to 5,000 years before present and younger are assigned a Class 1 PFYC rating, indicating a very low potential to contain unique paleontological resources. Middle Holocene-age deposits—dating to 10,000 years before present and older—are assigned a Class 2 PFYC rating, indicating a low potential to contain unique paleontological resources, but the potential increases for the older, deeper layers of these deposits. Holocene-age deposits typically overlie older, Pleistocene-age deposits; in general, Pleistocene-age sedimentary deposits are considered to have a high potential to contain unique paleontological resources. However, while fossil occurrences are more common in Pleistocene-age deposits, the potential to encounter unique fossils in deposits of this age within the City varies widely. Due to the variability in fossil occurrence in Pleistocene-age deposits in the City, deposits of this age are assigned a Class 3 PFYC rating, which indicates that there is a moderate potential to contain unique paleontological resources.

Within the Plan area, the depth to the more sensitive deposits varies, and the exact transition from low to moderate potential in the subsurface is unknown. The planning department would conduct a preliminary paleontological resource analysis, as described above, and determine if it is applicable to project construction activities. Excavations associated with subsequent projects that meet the depth and volume thresholds (greater than 5 feet in depth and more than 2,500 cubic yards) and extend into terrestrial sedimentary deposits of Pleistocene-age or older would have a moderate potential to encounter significant paleontological resources, based on the PFYC system. Without mitigation, future excavations could damage or destroy unique paleontological resources in the Plan area, resulting in a potentially significant impact.

To reduce the potential impacts to paleontological resources, **Mitigation Measure M-GE-6a, Unanticipated Discovery of Paleontological Resources during Construction**, would be applied to any subsequent project if determined applicable by the planning department during environmental evaluation as described above. Mitigation Measure M-GE-6a would require the Port to arrange a worker awareness training program for all on-site personnel. The training would inform personnel about what types of resources may be encountered during excavations and the proper procedures to follow in the event of a fossil discovery. In the event of a fossil discovery, a qualified paleontologist would be retained to determine the significance of the find; if the discovery is deemed significant, the qualified paleontologist would determine if a Paleontological Monitoring Program is appropriate and if so, prepare one. If a Paleontological Monitoring Program is deemed necessary, then **Mitigation Measure M-GE-6b, Paleontological Resource Monitoring Plan during Construction**, would be required. Mitigation Measure M-GE-6b would require the preparation of a Paleontological Resource Monitoring Plan, which would involve a qualified paleontologist developing a plan based on the site's geology and the project details. The plan would dictate the procedures for construction monitoring, fossil salvage and treatment procedures, and museum repository information. Implementation of Mitigation Measures M-GE-6a and M-GE-6b would reduce the likelihood that significant, or unique, paleontological resources would be destroyed or lost. Adherence to the requirements of Mitigation Measures M-GE-6a and M-GE-6b would ensure impacts to unique paleontological resources are ***less than significant with mitigation***.

Mitigation Measure M-GE-6a: Unanticipated Discovery of Paleontological Resources during Construction. The following procedures must be undertaken for project construction activities:

- *Worker Awareness Training.* Prior to commencing construction, and ongoing throughout ground disturbing activities (e.g., excavation, utility installation), the project sponsor and/or their designee shall ensure that all project construction workers are trained on the contents of the Paleontological Resources Alert Sheet, as provided by the planning department. The Paleontological Resources Alert Sheet shall be prominently displayed at the construction site during ground disturbing activities for reference regarding potential paleontological resources.

  In addition, the project sponsor shall inform the contractor and construction personnel of the immediate stop work procedures and other procedures to be followed if bones or other potential fossils are unearthed at the project site. Should new workers that will be involved in ground disturbing construction activities begin employment after the initial training has occurred, the construction supervisor shall ensure that they receive the worker awareness training as described above.

  The project sponsor shall complete the standard form/affidavit confirming the timing of the worker awareness training to the Environmental Review Officer (ERO). The affidavit shall confirm the project's location, the date of training, the location of the informational handout display, and the number of participants. The affidavit shall be transmitted to the ERO within 5 business days of conducting the training.

- *Paleontological Resource Discoveries.* In the event of the discovery of an unanticipated paleontological resource during project construction, ground disturbing activities shall temporarily be halted within 25 feet of the find until the discovery is examined by a qualified paleontologist as recommended by the Society of Vertebrate Paleontology standards (SVP 2010) and Best Practices in Mitigation Paleontology (Murphey et al. 2019). Work within the sensitive area shall resume only when deemed appropriate by the qualified paleontologist in consultation with the ERO.

The qualified paleontologist shall determine: (1) if the discovery is scientifically significant; (2) the necessity for involving other responsible or resource agencies and stakeholders, if required or determined applicable; and (3) methods for resource recovery. If a paleontological resource assessment results in a determination that the resource is not scientifically important, this conclusion shall be documented in a Paleontological Evaluation Letter to demonstrate compliance with applicable statutory requirements (e.g., Federal Antiquities Act of 1906, CEQA Guidelines section 15064.5, California Public Resources Code chapter 17, section 5097.5, Paleontological Resources Preservation Act 2009). The Paleontological Evaluation Letter shall be submitted to the ERO for review within 30 days of the discovery.

If the qualified paleontologist determines that a paleontological resource is of scientific importance, and there are no feasible measures to avoid disturbing this paleontological resource, the qualified paleontologist shall prepare a Paleontological Mitigation Program. The mitigation program shall include measures to fully document and recover the resource of scientific importance. The qualified paleontologist shall submit the mitigation program to the ERO for review and approval within 10 business days of the discovery. Upon approval by the ERO, ground disturbing activities in the project area shall resume and be monitored as determined by the qualified paleontologist for the duration of such activities.

The mitigation program shall include: (1) procedures for construction monitoring at the project site; (2) fossil preparation and identification procedures; (3) curation of paleontological resources of scientific importance into an appropriate repository; and (4) preparation of a Paleontological Resources Report (report or paleontology report) at the conclusion of ground disturbing activities. The report shall include dates of field work, results of monitoring, fossil identifications to the lowest possible taxonomic level, analysis of the fossil collection, a discussion of the scientific significance of the fossil collection, conclusions, locality forms, an itemized list of specimens, and a repository receipt from the curation facility. The project sponsor shall be responsible for the preparation and implementation of the mitigation program, in addition to any costs necessary to prepare and identify collected fossils, and for any curation fees charged by the paleontological repository. The paleontology report shall be submitted to the ERO for review within 30 business days from conclusion of ground disturbing activities, or as negotiated following consultation with the ERO.

Mitigation Measure M-GE-6b: Paleontological Resource Monitoring Plan during Construction. During the course of implementing Mitigation Measure M-GE-6a, if a significant paleontological resource is encountered, the project sponsor shall engage a qualified paleontologist to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those likely to affect sediments with moderate sensitivity for paleontological resources. Prior to issuance of any demolition permit, the project sponsor shall submit the Paleontological Resource Monitoring Plan to the ERO for approval.

At a minimum, the plan shall include:

1. Project Description
2. Regulatory Environment – outline applicable federal, state, and local regulations
3. Summary of Sensitivity Classification(s)
4. Research Methods, including but not limited to:
    4a. Field studies conducted by the approved paleontologist to check for fossils at the surface and assess the exposed sediments.
    4b. Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area.
    4c. Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley.
5. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known.
6. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include:
    6a. Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation.

6b. Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery.

6c. Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Standard monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (moderate, high and very high potential); while spot-check monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (moderate or unknown potential).

6d. Data recovery and reporting: Fossil and associated data discovered during soils disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report.

The consultant shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the consultant shall be considered draft reports subject to revision until final approval by the ERO. The final monitoring report and any data recovery report shall be submitted to the ERO prior to the certificate of occupancy.

Impact C-GE-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts on geology, soils, or paleontological resources. ***(Less than Significant)***

Although the entire bay area is located within a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions, the geographic scope of cumulative geology and soils impacts is restricted to the Plan area and adjacent areas because related risks are relatively localized or even site-specific. Therefore, the potential for subsequent projects that could occur pursuant to the Waterfront Plan to combine with cumulative projects to result in a significant cumulative impact related to geology, soils, and paleontological resources would be low. In addition, the cumulative projects and subsequent projects pursuant to the Waterfront Plan would be subject to building department requirements for geotechnical review and required to comply with the state and local building codes. Therefore, subsequent projects that could occur pursuant to the Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts and the impact would be ***less than significant***.

Mitigation: None required.

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17. Hydrology and Water Quality

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
17. HYDROLOGY AND WATER QUALITY. Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:					
i) Result in substantial erosion or siltation on- or offsite;	☐	☐	☒	☐	☐
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 a project inundation?	☐	☐	☒	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

SURFACE WATER HYDROLOGY

The Plan area is adjacent to San Francisco Bay, which connects the Pacific Ocean with San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin Delta to the north and east. The San Francisco Bay is an estuarine environment that receives saltwater inputs from the Pacific Ocean through the Golden Gate, and freshwater inputs from the Sacramento-San Joaquin Delta to the northeast, as well as various other tributary rivers and creeks located around San Francisco Bay.

The Plan area is within the North Shore, Channel, and Islais Creek watersheds. The Plan area is developed, with the exception of wetland areas along the eastern edge of Pier 94 and Heron's Head Park. The vast majority

of this area is served by a separate storm drain system operated by the Port, and stormwater either drains directly to the bay without treatment, is treated with landscape swales and directed to the bay, or infiltrates to the ground in areas without a separate drain system. Most stormwater runoff from the piers discharges directly to San Francisco Bay from streets and piers.[234] The state board classifies these areas where stormwater drains to the bay as a municipal separate storm sewer system. Stormwater runoff from other portions of the Plan area drain to the City's combined sewer system operated by SFPUC.[235] This combined sewer system collects and transports both wastewater and stormwater runoff in the same set of pipes, and the combined flows are all treated at the same treatment facilities.

WATER QUALITY

The quality of stormwater runoff from the Plan area is typical of urban watersheds where water quality is affected primarily by discharges from both point and nonpoint sources. Point-source discharges are known sources of pollutants, such as outfalls, while nonpoint source discharges generally result from diffuse sources, such as land runoff, precipitation, or seepage. Some common pollutants associated with activity along the San Francisco waterfront include motor oil, vehicle wash water, trash, abandoned waste, sediment from construction sites, and bilge water from recreational and commercial watercraft.[236]

GROUNDWATER HYDROLOGY

The Plan area is within the Downtown San Francisco and Islais Valley Groundwater Basins.[237] Along the waterfront, the groundwater table fluctuates with the tides, but is on average equal to mean sea level, which is midway between high and low tide.[238] Groundwater recharge to the Downtown San Francisco groundwater basin occurs from infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes. Recharge due to leakage from municipal water and sewer pipes accounted for about half of the total recharge of groundwater in the San Francisco area in previous estimates.[239] Sources of recharge to the Islais Valley groundwater basin include infiltration of rainfall, irrigation return flows, and leakage from water and sewer pipes.[240]

GROUNDWATER QUALITY

Groundwater within the Downtown basin is subject to high concentrations of nitrates and elevated chloride, boron and total dissolved solids concentrations. High nitrate levels and are attributed to groundwater recharge from sewer pipe leakage and possibly to fertilizer introduced by irrigation return flows. Elevated chloride and total dissolved solids levels are most likely due to a combination of leaky sewer pipes, historic and current seawater intrusion, and connate water.[241] Groundwater in the Islais Creek basin is also subject to

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[234] Port of San Francisco, Stormwater, https://sfport.com/stormwater-management-program, accessed February 2, 2021.
[235] San Francisco Separate Sewer (MS4) Area Map, http://sfgov.maps.arcgis.com/home/webmap/viewer.html?webmap=d136341cbce04e80b7f88e59334accc9&extent=-122.5964,37.6627,-122.2836,37.8562, accessed February 2, 2021.
[236] Port of San Francisco, Stormwater, https://sfport.com/stormwater-management-program, accessed February 2, 2021.
[237] San Francisco Bay Regional Water Quality Control Board, *San Francisco Bay Basin Plan*, adopted May 4, 2017.
[238] CH2M and Arcadis, *Port of San Francisco Waterfront Resilience Program Multi-Hazard Risk Assessment Northern Waterfront and Embarcadero Seawall Summary Report*, prepared for Port of San Francisco, August 2020.
[239] California Department of Water Resources, *California's Groundwater Bulletin 118, San Francisco Hydrologic Region, Downtown San Francisco Groundwater Basin*, last update February 27, 2004.
[240] Ibid.
[241] California Department of Water Resources, *California's Groundwater Bulletin 118, San Francisco Hydrologic Region, Downtown San Francisco Groundwater Basin*, last update February 27, 2004. Connate water is water that was trapped within the pores of sedimentary deposits as they were being deposited.

high total dissolved solids concentrations, and high chloride concentrations have been observed in previous studies.[242]

FLOODING

Some low-lying areas along San Francisco's bay shoreline are subject to flooding during extreme high tides, storm surge, and waves, although these occurrences are relatively rare in San Francisco compared to areas prone to hurricanes or other major coastal storms.

As part of the National Flood Insurance Program ("NFIP"), Federal Emergency Management Agency (FEMA) issued the final flood insurance rate maps ("FIRMs") for City and County of San Francisco on September 23, 2020. This is the first time FEMA has mapped flood risks for the City and County of San Francisco. FIRMs were later adopted by the Board of Supervisors through Ordinance 226-20 with an effective date of March 23, 2021. The FIRMs are available for viewing at https://msc.fema.gov/portal/home.

Based on detailed studies of coastal flood hazards associated with San Francisco Bay and the Pacific Ocean, the final FIRMs designate portions of the City, including portions of the waterfront, Mission Bay, Islais Creek, Bayview Hunters Point, Hunters Point Shipyard, Candlestick Point, Treasure Island, San Francisco International Airport, and Ocean Beach, in coastal flood hazard areas. Referred to as "Special Flood Hazard Areas" (SFHAs), these areas are subject to inundation during a flood having a 1 percent chance of occurrence in any given year. They are shown as zones beginning with the letter "A" or "V" on the FIRMs. Port's structures over water, including piers and wharfs, are designated as Zone D (area of undetermined flood hazard). Zone D areas are not subject to San Francisco Building Code and NFIP regulation. Port-owned historic structures are also exempted from compliance under the NFIP. The City has adopted a floodplain management ordinance in accordance with NFIP requirements. Under the ordinance, the City must regulate new construction and substantial improvements or repairs to structures in SFHAs to reduce the risk of flood damage. The Port Building Code already has provisions to address flood risks in SFHAs affecting Port-owned property.

Additionally, SFPUC has developed a 100-Year Storm Flood Risk Map that shows areas of San Francisco where significant flooding from storm runoff is highly likely to occur during a 100-year storm. More information about this map, including a searchable web map, is available at https://www.sfwater.org/index.aspx?page=1229. The SFPUC 100-Year Storm Flood Risk Map only shows flood risk from storm runoff. The City is not requiring floodproofing measures in the flood hazard areas shown on this map at this time.

The SFPUC map does not consider flood risk in San Francisco from inundation from the San Francisco Bay or Pacific Ocean, which are shown on the FIRMs that FEMA has prepared for San Francisco. Conversely, the FIRMs do not show flooding from storm runoff in San Francisco, because historical creeks and other inland waterbodies have been built over and are no longer open waterways. In most areas, the flood hazards identified by SFPUC and FEMA are separate. There are a few areas, however, near the shoreline where SFPUC's Flood Risk Zones overlap with the FEMA-designated SFHAs.

Flooding conditions in the Plan area along San Francisco's bay shoreline would be exacerbated with projected sea-level rise over the remainder of the century due to climate change. Coastal areas are vulnerable to periodic flooding due to extreme tides, storm surge, storm waves, and El Niño storm events. These conditions can result in many effects, including flooding of low-lying areas including roads, boardwalks, and waterfront

[242] California Department of Water Resources, *California's Groundwater Bulletin 118, San Francisco Hydrologic Region, Islais Valley Groundwater Basin*, last update February 27, 2004.

promenades; storm drain backup; wave damage to coastal structures; and erosion of natural shorelines. Rising sea level due to climate change has the potential to increase the frequency, severity, and extent of flooding as a result of these conditions. FEMA FIRMs did not consider future sea-level rise in assessing the flood risks. Additional floodplain information can be found on the San Francisco Floodplain Management Program website at https://www.onesanfrancisco.org/San-Francisco-Floodplain-Management-Program and FEMA's NFIP website at www.FloodSmart.gov.

Most of the Plan area is within the city's sea-level rise vulnerability zone.[243] The sea-level rise vulnerability zone is 108 inches above today's high tide (mean higher high water). This includes 66 inches of sea-level rise plus 42 inches of tidal and storm surge, an upper-range scenario for end of century.

ANALYSIS APPROACH

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. The Waterfront Plan introduces a new Resilience goal that includes policies to support a program of resilience planning that is transparent and accountable to public engagement to adapt waterfront risks, conditions and priorities over time (Policy 4a-h). These policies include provisions to protect and enhance existing critical Port and city utilities and infrastructure and community, historic, and economic assets for as long as possible; to ensure the viability of diverse maritime facilities along the waterfront while reducing risk and advancing resilience adaptation over time; flood protection and sea-level rise adaptation in new projects; and coordination with City's resilience framework, and state and federal agency's resilience planning programs, including BCDC. Effects on hydrology and water quality could result as subsequent projects that could occur pursuant to the Waterfront Plan are implemented. Therefore, this section evaluates hydrology and water quality impacts that could result from subsequent projects that could occur pursuant to the Plan.

IMPACTS AND MITIGATION MEASURES

Impact HY-1: The Waterfront Plan could violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality, and could conflict with or obstruct implementation of a water quality control plan. ***(Less than Significant with Mitigation)***

CONSTRUCTION

STORMWATER RUNOFF

Implementation of subsequent projects pursuant to the Waterfront Plan could include construction activities such as demolition, grading, excavation, new building construction, paving, and landscaping. Land-disturbing activities and the placement of stockpiles in proximity to storm drain inlets or nearby surface waters may result in a temporary increase in sediment loads in San Francisco Bay. Pollutants, such as nutrients, trace metals, and hydrocarbons attached to sediment, can be transported with sediment to downstream locations and degrade water quality. The delivery, handling, and storage of construction materials and wastes (e.g., concrete debris), as well as the use of heavy construction equipment, could also result in stormwater contamination, thereby affecting water quality. Construction activities may involve the use of chemicals and operation of heavy equipment, which could result in accidental spills of hazardous materials (e.g., fuel and oil) during construction activities. Such spills could enter the groundwater aquifer or nearby surface water bodies from

[243] San Francisco Planning, Sea Level Rise Adaptation, https://sfplanning.org/sea-level-rise-action-plan#vulnerability-zone, accessed February 2, 2021.

runoff or storm drains. Constituents in fuel, oil, and grease can be acutely toxic to aquatic organisms and/or bioaccumulate in the environment. Construction activities resulting from subsequent projects would be subject to a number of regulatory requirements described below.

CONSTRUCTION ACTIVITIES THAT DRAIN TO THE COMBINED SEWER SYSTEM

The City currently holds a NPDES permit (order R2-2013-0029), adopted by the regional board in August 2013, that covers the combined sewer system and associated treatment facilities that discharge to the San Francisco Bay. The permit (referred to as the Bayside NPDES Permit) specifies discharge prohibitions, dry weather effluent limitations, wet weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements. Areas in the Bayside drainage basin that drain to the city's combined sewer system are subject to this permit. This permit must be renewed every five years (but is automatically extended until renewal if the permit expires before renewal is complete), and the renewed permit incorporates any changes in operation of the treatment facilities and applicable water quality standards and effluent limitations.

Construction activities conducted within areas served by the city's existing combined sewer system or any new combined sewer system infrastructure would be subject to the construction site runoff requirements of public works code article 4.2, section 146. The purpose of section 146 and the City's construction site runoff control program is to protect water quality by controlling the discharge of sediment and other pollutants from construction sites. Implementation of the construction site runoff measures specified in section 146 ensures compliance with the Bayside NPDES permit.

Each subsequent project pursuant to the Waterfront Plan that disturbs more than 5,000 square feet of area and drains to the combined sewer system would require a Construction Site Runoff Control Permit. The permit application must include an erosion and sediment control plan that provides a vicinity map showing the location of the site in relationship to the surrounding area's water courses, water bodies, and other significant geographic features; a site survey; suitable contours for the existing and proposed topography; area drainage; proposed construction and sequencing; proposed drainage channels; proposed erosion and sediment controls; dewatering controls where applicable; soil stabilization measures where applicable; maintenance controls; sampling, monitoring, and reporting schedules; and any other information deemed necessary by SFPUC. The erosion and sediment control plan also would include the appropriate best management practices to prevent stormwater contact with hazardous materials stored at the construction site and to limit the potential for a release of these hazardous materials that could affect water quality. Subsequent projects that disturb less than 5,000 square feet would not need to apply for a Construction Site Runoff Control Permit and would not be subject to a SWPPP.

Article 4.2 also specifies that the contractor must provide adequate dust controls in conformance with applicable air pollution laws and regulations (including article 22B of the health code, described in Section E.18, Hazards and Hazardous Materials). Improvements to any existing grading, ground surface, or site drainage must also meet the requirements of article 4.2 for new grading, drainage, and erosion control. A building permit cannot be issued until a Construction Site Runoff Control Permit has been issued.

Under the Construction Site Runoff Control Permit, the Port would be required to conduct regular inspections and maintenance of all erosion and sediment controls and must provide inspection and maintenance information to SFPUC. SFPUC also would conduct periodic inspections of the subsequent sites to ensure compliance with the plan. The Port would be required to notify SFPUC at least two days prior to the start of construction, at completion of installation of erosion and sediment control measures, at completion of final

grading, and at project completion. At SFPUC's discretion, sampling, metering, and monitoring may also be required.

Implementation of the construction site runoff requirements in article 4.2 of the public works code, section 146, would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff in areas served by the existing or future combined sewer system would be ***less than significant***.

CONSTRUCTION ACTIVITIES WITHIN PORT JURISDICTION THAT DRAIN TO SAN FRANCISCO BAY

Stormwater discharges from areas managed by the Port that drain to San Francisco Bay are regulated under the state board's Water Quality Order No. 2013-0001-DWQ, NPDES General Permit for Waste Discharge Requirements (WDRs) for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems. To ensure compliance with these WDRs, all construction sites within Port jurisdiction are required to implement best management practices to protect stormwater quality. The Port requires contractors to submit an erosion and sediment control plan and permit application for construction sites that disturb 5,000 square feet or more of uncovered ground surface, or are designated as high risk. Erosion and sediment control plans must be approved prior to the issuance of certain permits, including all grading permits, most building permits, and other permits at the discretion of the Port.[244]

However, if a subsequent project disturbs one acre or more of soil, it is subject to the state's 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), also known as the Construction General Permit. The Construction General Permit regulates stormwater discharges associated with construction or demolition activities, such as clearing and excavation; building construction; and linear underground/overhead projects, including installation of water pipelines and other utility lines. In this case, the SWPPP developed pursuant to the Construction General Permit may substitute for the erosion and sediment control plan. Under the Construction General Permit, construction activities associated with subsequent projects would be characterized by the level of risk to water quality. This is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Risk Level 1, Level 2, or Level 3, and the minimum best management practices (stormwater controls) and monitoring that must be implemented during construction are based on the risk level. The best management practices are designed to prevent pollutants from coming into contact with stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. They are specified in an SWPPP that must be prepared by a qualified SWPPP developer and submitted to the regional board before construction begins.

Implementation of specified control measures in an erosion and sediment control plan or SWPPP would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff to San Francisco Bay would be ***less than significant***.

CONSTRUCTION DEWATERING

Groundwater from construction site dewatering activities, if needed, could contain contaminants related to past site activities as well as sediment and suspended solids. Any groundwater encountered during

[244] Port of San Francisco, Stormwater Management Requirements and Design Guidelines, https://sfport.com/node/5558, accessed November 10, 2021.

construction of subsequent projects pursuant to the Waterfront Plan would be subject to requirements of the City's Sewer Use Ordinance (article 4.1 of San Francisco Public Works Code; added by ordinance No. 19-92, amended by ordinance No. 116-97), as supplemented by San Francisco Public Works Order No. 158170, requiring a permit from the Wastewater Enterprise Collection System Division of SFPUC to discharge to the combined sewer system. A permit may be issued only if an effective pretreatment system is maintained and operated. Each permit for such discharge would contain specified water quality standards and may require the project sponsor to install and maintain meters to measure the volume of the discharge to the combined sewer system. In addition, if a subsequent project-specific geotechnical investigation determines that dewatering wells would be needed to draw the groundwater down below the planned depths of excavation, those dewatering wells would be subject to the requirements of the City's Soil Boring and Well Regulation Ordinance (Health Code article 12B, added by ordinance 113-05), requiring a project sponsor to obtain a permit from the San Francisco Department of Public Health (health department) prior to constructing a dewatering well. A permit may be issued only if the Port uses construction practices that would prevent the contamination or pollution of groundwater during the construction or modification of the well or soil boring.

IN-WATER STRUCTURES

The Waterfront Plan's maritime policies encourage the development of new commercial and recreation-oriented maritime activities, including potential development of a second cruise ship berth. Subsequent projects could include in-water work, such as removal of piles or installation of new piles, which would have the potential to affect the speed and direction of currents in the bay and could result in associated changes in sediment transport, water quality, and salinity. Implementation of **Mitigation Measure M-HY-1, Water Quality Best Management Practices for In-Water Work**, would reduce the potential for in-water work associated with subsequent projects to degrade water quality; therefore, impacts would be ***less than significant with mitigation***.

> **Mitigation Measure M-HY-1: Water Quality Best Management Practices for In-Water Work.** The project sponsor shall implement water quality best management practices to protect water quality from pollution due to fuels, oils, lubricants, and other harmful materials, as determined in consultation with the Environmental Planning Division of the San Francisco Planning Department based on review of engineering and construction details of project improvements. The Planning Department shall review best management practices detailed in the San Francisco Department of Public Health Pollution Prevention Toolkit for Maritime Industries along with other measures as may be identified to address specific construction details of proposed project improvement to determine the specific mitigation details, which may include:
>
> - Preparation of a spill prevention control and countermeasure (SPCC) plan to address the emergency cleanup of any hazardous material and will be available on site, which typically includes:
>   - Methods to address the emergency cleanup of any hazardous material and what materials will be available on site;
>   - SPCC, hazardous waste, stormwater and other emergency planning requirements;
>   - Measures to prevent spills into the Bay associated with in water fueling, if in water fueling is required on some of the construction barges. Such measures can include:
>   - Secondary booms and/or pads, depending upon where fueling would take place on the vessel;

    - Secondary containment on the deck of the vessel to contain the petroleum product;
    - Specifying volume of petroleum products that will be on the vessel and evaluating the potential for spills. Absorbent and cleanup materials (such as oil sorbent boom, heavy oil pads, Oil-Dri Absorbent Floor, etc.) of sufficient quantity to clean up potential spill volume shall be provided; and
    - The locations of properly permitted offsite locations where vessels will be fueled.
- Fueling of equipment consistent with proper fuel transfer procedures as per U.S. Coast Guard regulations (33 CFR 156.120 and 33 CFR 155.320), including inspection requirements of spill containment and the fueling location to document that no spills have occurred, or that any spills are cleaned up immediately.
- Well-maintained equipment is used to perform the construction work, and equipment maintenance is performed off site when possible. Daily equipment inspections to help prevent leaks or spills. Leaks or spills are best cleaned up when discovered, with proper disposal of cleaning materials;
- Precautions to protect listed species, their habitats, and Essential Fish Habitat from construction by-products and pollutants such as demolition debris, construction chemicals, fresh cement, saw-water, or other deleterious materials. Construction will be conducted from both land and water, and care shall be used by equipment operators to control debris so that it does not enter the Bay.
- A materials management disposal plan (MMDP) to prevent any debris from falling into the Bay during construction to the maximum extent practicable. The measures identified in the MMDP are commonly based on the Best Available Technology, and may include:
    - During construction, any barges performing the work shall be moored in a position to capture and contain the debris generated during any sub-structure or in-water work. In the event that debris does reach the Bay, personnel in workboats within the work area shall immediately retrieve the debris for proper handling and disposal. All debris shall be disposed of at an authorized upland disposal site;
    - Measures to ensure that fresh cement or concrete shall not be allowed to enter San Francisco Bay. Construction waste shall be collected and transported to an authorized upland disposal area, and per federal, state, and local laws and regulations;
    - All hazardous material shall be stored upland in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use shall be permitted with the same anti-spill precautions;
    - All construction material, wastes, debris, sediment, rubbish, trash, fencing, etc., shall be removed from the site once the proposed project is completed and transported to an authorized disposal area, in compliance with applicable federal, state, and local laws and regulations;
    - Construction material shall be covered every night and during any rainfall event (if there is one);
    - Construction crews shall reduce the amount of disturbance within the project site to the minimum necessary to accomplish the project; and
    - Measures to prevent saw water from entering the Bay.

OPERATIONS

STORMWATER QUALITY

The Waterfront Plan includes a goal to support an environmentally sustainable Port and associated policies to improve water quality. Strategies include promoting remediation of contaminated sites, and repairing and constructing new wastewater and green infrastructure to reduce sewage overflows, and make such infrastructure more resilient to sea-level rise and extreme weather. However, subsequent projects that could occur pursuant to the Waterfront Plan could increase existing or generate new levels of potential water quality pollutants such as trash, sediment, pesticides, bacteria, nutrients, metals, oils, and other toxins. These pollutants could reach surface waters in the vicinity through storm drains and ultimately discharge to San Francisco Bay. Operation and maintenance activities could generate pollutants of concern from landscape maintenance, building maintenance, Port facility maintenance, the storage of materials and substances, and vehicle use. All flows collected by the combined sewer system would be treated in the city's wastewater treatment facilities prior to discharge through an existing outfall or overflow structure to the bay. As noted above, some subsequent projects would drain to the existing combined sewer system, while other development such as that on piers or otherwise in or over the bay, would drain to San Francisco Bay.

Stormwater discharges from the City and County of San Francisco and the Port are subject to the Bayside NPDES Permit and the General Permit for Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, as discussed above. To ensure compliance with these WDRs, in 2016 the City and County of San Francisco adopted ordinance 64-16, Stormwater Management Requirements, which modified San Francisco public works code section 147 et seq. to reduce the volume of stormwater entering the city's combined and separate sewer systems and to protect and enhance the water quality of receiving waters. The Port and SFPUC subsequently developed the San Francisco SMR. The SMR apply to projects that create or replace 2,500 square feet or more of impervious surface ("small projects") in areas that drain to a separate storm sewer system, or to projects that create or replace 5,000 square feet of impervious surface ("large projects") in areas that drain to the combined sewer system and a separate storm sewer system. Yearly self-certification and inspection reports must be submitted to the Port annually. Additional inspection requirements may be detailed in project-specific Stormwater Control Plans developed for individual projects.

In accordance with the SMR, stormwater controls for subsequent projects that discharge to any new separate stormwater system would be designed to treat rainfall from the 90th percentile, 24-hour storm and include measures to reduce or eliminate downstream water pollution. In areas served by the combined sewer system, San Francisco Public Works Code article 4.2, section 147, and the SMR would require that the stormwater controls for subsequent projects reduce or maintain existing stormwater runoff flow rates and volumes. Stormwater management measures would rely on low-impact development techniques, such as green roofs, pervious pavement, rain gardens, or bio-retention areas, to reduce pollutant discharges.

Subsequent projects that could occur pursuant to the Waterfront Plan may include construction of over water features (such as piers, platforms, or gangways and floats), which would be constructed over the bay and would not be considered new impervious surfaces under the Stormwater Management Requirements. The structures would redirect rainwater that would have normally fallen directly into the bay, and would not increase the amount of stormwater runoff.

In addition to the City's Stormwater Management Requirements, specific categories of commercial and industrial facilities would be required to obtain coverage under the state Industrial General Permit to operate within the project area. The Industrial General Permit requires elimination of unauthorized non-stormwater discharges, preparation of an SWPPP describing best management practices that the facility will implement to reduce pollution in stormwater runoff, implementation of specific monitoring and sampling activities, and submittal of annual reports to the state board. While many of the types of facilities typically covered by the Industrial General Permit are not allowed according to current zoning, transportation facilities (including water transport) that include vehicle maintenance functions (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication) can be covered by this permit.

Compliance with applicable requirements would ensure that stormwater discharges from subsequent projects that could occur with implementation of the Waterfront Plan to the Port's separate stormwater system, or the combined stormwater system, would not exceed the capacity of these systems or provide additional sources of polluted runoff. Therefore, this impact would be ***less than significant***.

WATER QUALITY EFFECTS RELATED TO LITTERING

Subsequent projects that could occur pursuant to the Waterfront Plan could increase the potential for litter entering the bay. The state board has listed the adjacent Lower San Francisco Bay as impaired for trash under CWA section 303(d).[245] CWA section 303(d) requires states to present the USEPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards. The CWA requires the development of total maximum daily loads to improve water quality of impaired water bodies. While Lower San Francisco Bay is listed as impaired for trash, a total maximum daily load has not yet been completed (but is scheduled for completion in 2021).[246] In accordance with article 6 of the San Francisco Health Code, Garbage and Refuse, subsequent projects would be required to place containers in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. Furthermore, article 6 prohibits the dumping of refuse onto any streets or lands within San Francisco.

Subsequent projects pursuant to the Waterfront Plan would be required to comply with several City ordinances, as discussed in Section E.13, Utilities and Service Systems, which would decrease the amount of non-degradable trash generated development that could occur pursuant to the Waterfront Plan. The San Francisco Mandatory Recycling and Composting Ordinance requires facilities to separate their refuse into recyclables, compostables, and trash. In addition, the Food Service Waste Reduction Ordinance (San Francisco Environment Code chapter 16, sections 1601 through 1611) prohibits any establishment that serves food prepared in San Francisco from using polystyrene foam (Styrofoam) to-go containers. This ordinance also requires that any containers used in the City's programs be either recyclable or compostable.

Compliance with the regulatory requirements described above would reduce the amount of non-recyclable and non-compostable wastes produced at subsequent project sites, would ensure that adequate containers and refuse service are provided, and would ensure that offshore San Francisco Bay water is kept free of trash as a result of littering. This would reduce the potential for transport of litter to the combined sewer system and

[245] California State Water Resources Control Board, *Final 2014 and 2016 Integrated Report* (CWA Section 303(d) List / 305(b) Report), Category 5, October 3, 2017, https://www.waterboards.ca.gov/water_issues/programs/tmdl/2014_16state_ir_reports/category5_report.shtml, accessed May 13, 2021.
[246] Ibid.

directly to San Francisco Bay via wind or stormwater runoff. Therefore, water quality impacts related to littering would be ***less than significant***.

Impact HY-2: The Waterfront Plan would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the Plan may impede sustainable groundwater management of the basin or conflict with a sustainable groundwater management plan. ***(Less than Significant)***

Groundwater is present in the Plan area, and the groundwater table is generally at sea level. The Plan area is located in the Downtown San Francisco and Islais Creek Groundwater Basins, which are not used as a drinking water supply.[247] In 2015, SFPUC submitted a notice of intent to become the exclusive groundwater sustainability agency for groundwater basins within the city limits of San Francisco, including the Downtown Groundwater Basin and the majority of the Islais Valley Groundwater Basin. SFPUC intends to prepare a groundwater sustainability plan for San Francisco groundwater basins but has not yet adopted such a plan. Subsequent projects that could occur pursuant to the Waterfront Plan could require excavation and dewatering may be required during such activities. In the event that groundwater is encountered during construction, dewatering be temporary and would not result in chronic lowering of groundwater levels or an unreasonable depletion of groundwater supply, or conflict with or obstruct implementation of a sustainable groundwater management plan. The Waterfront Plan would not deplete groundwater resources because there are no plans for development of these basins for groundwater production.[248] The Waterfront Plan would not interfere with groundwater recharge because subsequent projects would primarily replace existing impervious areas, and would implement stormwater controls that would facilitate infiltration of treated stormwater to the groundwater. Therefore, the Waterfront Plan would have ***less-than-significant*** impacts related to groundwater resources.

Mitigation: None required.

Impact HY-3: The Waterfront Plan would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion, siltation, or flooding on or off site. ***(Less than Significant)***

The Plan area includes developed tidal inlets of Mission Creek and Islais Creek but would not alter the course of either of these streams. Incorporation of stormwater management features at sites of subsequent projects within the Plan area in accordance with the City's stormwater management requirements, discussed in greater detail in Impact HY-1, would ensure that drainage from the project area would not cause onsite or offsite erosion, siltation, or flooding. Grading associated with subsequent projects would be required to comply with best management practices identified in an erosion and sediment control plan or SWPPP to avoid affecting water quality, and would not substantially alter the existing drainage pattern. Much of the Plan area is heavily developed; however, the effects of additional impervious area due to subsequent projects would be offset by the requirements of the stormwater management ordinance, which requires stormwater controls for

[247] San Francisco Public Utilities Commission, *2015 Urban Water Management Plan for the City and County of San Francisco*, June 2016. With the exception of the Westside and Lobos basins, all of the basins in San Francisco are generally inadequate to supply groundwater for municipal supply due to low yield, contamination, or potential subsidence concerns.
[248] Ibid.

subsequent projects that discharge to any new separate stormwater system be designed to treat rainfall from the 90th percentile, 24-hour storm and include measures to reduce or eliminate downstream water pollution. In areas served by the combined sewer system, San Francisco Public Works Code article 4.2, section 147, and the SMR would require that the stormwater controls for subsequent projects reduce or maintain existing stormwater runoff flow rates and volumes. Therefore, the Waterfront Plan would result in ***less-than-significant*** impacts related to alteration of existing drainage patterns and subsequent erosion, siltation, or flooding.

Mitigation: None required.

Impact HY-4: The Waterfront Plan would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. ***(Less than Significant)***

As discussed in Impacts HY-1 and HY-3, stormwater in the Plan area currently drains to either the combined sewer system or directly to San Francisco Bay via the separate storm sewer system, and the subsequent projects that could occur pursuant to the Waterfront Plan would not result in substantial additions of new impervious area. During operations of subsequent projects that could occur pursuant to the Waterfront Plan, stormwater would continue to drain either to the combined sewer system or the separate storm sewer system to the bay. In accordance with the SMR, stormwater controls for subsequent projects that discharge to the bay would be designed to treat rainfall from the 90th percentile, 24-hour storm and include measures to reduce or eliminate downstream water pollution. In areas served by the combined sewer system, San Francisco Public Works Code article 4.2, section 147, and the SMR would require that the stormwater controls for subsequent projects reduce or maintain existing stormwater runoff flow rates and volumes. Compliance with these design requirements, subject to approval by public works, would ensure that subsequent projects would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff, and this impact would be ***less than significant***.

Mitigation: None required.

Impact HY-5: The Waterfront Plan would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would impede or redirect flood flows. ***(Less than Significant)***

Subsequent projects that could occur pursuant to the Waterfront Plan would not alter the course of a stream or river. Subsequent projects could occur within areas mapped as a flood hazard zone on the City's 2008 Interim Flood Hazard Maps, and within areas at risk for flooding due to sea-level rise. Factors that could impede or redirect flood flows include the construction of new structures or changes in topography within the flood hazard zone, as well as an increase in stormwater runoff from the project area. As discussed above, subsequent projects that could occur pursuant to the Waterfront Plan would not increase stormwater runoff in the project area and therefore would not contribute to changes in flooding due to new impervious area. The new Resilient Port goal of the Waterfront Plan includes policies applicable to future development that continue to require that new Port projects include appropriate flood protection and sea-level rise adaptations

that advance Port and City goals. Subsequent projects may include construction of facilities within areas at risk for tidal flooding under current and future conditions, due to the scale of tidal flooding, which is a function of wave run-up and topographic elevations over large expanses of the shoreline. However, it is unlikely that displacement of the volume of water associated with such development projects would affect surrounding water surface elevations during a tidal flood, or result in additional areas becoming inundated. Therefore, impacts would be ***less than significant***.

Mitigation: None required.

Impact HY-6: The Waterfront Plan would not risk release of pollutants due to project inundation. ***(Less than Significant)***

The majority of the Plan area is located in an area identified for potential inundation in the event of a tsunami or seiche.[249] Based on modeling conducted in support of the Tsunami Annex to San Francisco's Emergency Response Plan, the maximum elevation of a potential wave from a local source tsunami is 6.3 feet North American Vertical Datum of 1988 (NAVD88) and the maximum elevation of a potential wave from a distant-source tsunami is 10.3 feet NAVD88. Mean higher high water (or "high tide") at the Ferry Building is considered to be 6.3 feet above NAVD88.[250] Daily high tides do not result in any flooding.

As discussed in Impact HY-5, portions of the project area are within current or future flood hazard zones. As discussed in Impact HY-1, subsequent projects that could occur pursuant to the Waterfront Plan would be required to comply with article 4.2 of the public works code, which requires implementation of source control measures that would reduce potential pollutant loads in the stormwater runoff. Source control measures described in the SMR include covering and hydraulically isolating pollutant generating activities, implementing maintenance activities such as regular sweeping of exposed areas, and using non-polluting building and maintenance materials. Treatment systems as part of the stormwater controls that would be implemented under the subsequent projects would further reduce pollutant loads in stormwater. One or more treatment controls would be required to address each of the potential stormwater pollutants of concern. Additionally, if subsequent projects include industrial activities, it would be required to prepare an SWPPP and implement best management practices pursuant to the Industrial General Permit. Implementation of these requirements would ensure that the Waterfront Plan would not risk release of pollutants due to project inundation. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-HY-1: The Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact on hydrology and water quality. ***(Less than Significant)***

The geographic scope for the analysis of cumulative impacts associated with surface hydrology and water quality consists of the North Shore, Channel, and Islais Creek watersheds. The context for groundwater hydrology consists of the Downtown San Francisco and Islais Creek groundwater basins. The North Shore,

[249] California Emergency Management Agency, California Geological Survey, University of Southern California, *Tsunami Inundation Map for Emergency Planning, San Francisco North Quadrangle/San Francisco South Quadrangle (San Francisco Bay)*, June 15, 2009

[250] CH2M and Arcadis, *Port of San Francisco Waterfront Resilience Program Multi-Hazard Risk Assessment Northern Waterfront and Embarcadero Seawall Summary Report*, Prepared for Port of San Francisco, August 2020.

Channel, and Islais Creek watersheds are already developed, and subsequent projects would mostly likely occur as redevelopment and not extensive new development on vacant land or open space.

Subsequent projects that could occur pursuant to the Waterfront Plan, combined with cumulative projects, would be required to comply with the same regulatory requirements noted above. These regulatory requirements have been developed to protect water quality, as defined in the Basin Plan, and require implementation of stormwater best management practices. Construction of projects within the geographic scope would be subject to the requirements of article 4.2 of the public works code or the Construction General Permit during construction, and the SMR during operation. Implementation of best management practices pursuant to these requirements would ensure that all discharges to the combined sewer system or the Port separate sewer system would comply with the NPDES permit for bayside facilities, and would not result in a violation of water quality standards or otherwise degrade water quality.

Implementation of best management practices pursuant to article 4.2 of the public works code and the SMR by all subsequent projects in the geographic scope also would ensure that cumulative impacts related to the alteration of drainage patterns or an exceedance of storm sewer capacity would be less than significant. This is primarily because most projects would be required to reduce stormwater flows from individual sites by 25 percent as compared to existing conditions.

Most cumulative projects in the Downtown San Francisco and Islais Creek groundwater basins would be redevelopment or infill projects in highly urbanized areas where recharge would not occur. Subsequent projects would be required to implement low impact development stormwater controls to improve the infiltration of stormwater, as required by the San Francisco SMR, which may increase groundwater recharge to the groundwater basin. Furthermore, a reduction in the amount of impervious area and increased groundwater recharge would reduce flood flows.

Groundwater within the Downtown San Francisco and Islais Creek Basins is not used for water supply. Therefore, the water supply necessary for construction and operation of subsequent projects and cumulative projects would not reduce the volume of groundwater within the Downtown San Francisco and Islais Creek Basins. Because of the lack of groundwater use and the presence of existing impervious surfaces in the area, the Waterfront Plan, combine with cumulative projects, would not result in a significant cumulative impact with regard to potential loss of groundwater recharge and supply. Therefore, this impact would be less than significant.

Overall, since subsequent projects that could occur pursuant to the Waterfront Plan, as well as cumulative projects, would be required to comply with regulations, cumulative impacts related to hydrology and water quality would be ***less than significant***.

Mitigation: None required.

18. Hazards and Hazardous Materials

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
18. HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or 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?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	☐	☐	☒

The Waterfront Plan area is not located within an airport land use plan area, nor is it within 2 miles of a public airport or public use airport. In addition, the Waterfront Plan area consists of developed areas along the San Francisco Bay waterfront, and is not adjacent to areas at risk of wildland fire. Therefore, topics E.18(e) and E.18(g) are not applicable to the Waterfront Plan and will not be addressed further in this initial study.

ENVIRONMENTAL SETTING

The Waterfront Plan area is a large geographic area that is heavily developed with a variety of land uses with a history of hazardous materials use. This variation in land uses (particularly industrial and maritime land uses) and history of hazardous materials use can lead to hazardous materials impacts.

Current and past industrial and maritime land uses (e.g., petroleum terminals, MUNI vehicle maintenance, railyards, shipyards), found throughout the Waterfront Plan area, can encompass a wide range of business operations with the potential to result in hazardous materials impacts. Industrial facilities store hazardous materials in underground storage tanks (USTs), aboveground storage tanks, and in designated storage locations. The presence of unrecorded industrial facilities, age, and improper storage tank maintenance in the Waterfront Plan area have been the common causes for soil and groundwater contamination. In addition, improper handling and storage of hazardous material containers can lead to hazardous material incidents.

A review of the state board's GeoTracker and California Department of Toxic Substances Control's (DTSC) EnviroStor websites identified over 60 currently active or closed hazardous materials cleanup sites are located within or adjacent to the Plan area, including multiple sites with land use restrictions.[251] The entire Plan area is mapped by the City as land with known or potential soil and/or groundwater contamination and subject to the City's Maher Ordinance.[252]

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Waterfront Land Use Plan to reflect revised or new goals, policies, and procedures. The Plan also would amend the planning code to create the Waterfront SUD 4, which would require waterfront design review process and procedures for future development on Port piers and seawall lots in the Mission Bay and Southern Waterfront subareas that are not included in the Mission Rock, Pier 70, or Potrero Power Station SUDs. Effects regarding hazards and hazardous materials could result as subsequent projects that could occur pursuant to the Waterfront Plan are implemented. Therefore, this section evaluates hazards and hazardous material impacts that could result from subsequent projects that could occur pursuant to the Plan.

Impact HZ-1: The Waterfront Plan would not create a significant hazard through the routine transport, use, or disposal of hazardous materials. ***(Less than Significant)***

CONSTRUCTION

Construction activities associated with subsequent projects that could occur pursuant to the Waterfront Plan could involve the transport and use of hazardous materials such as paints, petroleum products (e.g., asphalt, oil, and fuels), solvents, and adhesives. Transport, use, and disposal of such materials must be compliant with applicable regulations, such as U.S. Department of Transportation hazardous materials regulations, and California Division of Occupational Safety and Health (Cal/OSHA) regulations. An inadvertent release of large quantities of these materials into the environment could adversely affect soil and water quality. As described in Section E.17, Hydrology and Water Quality, future development would be subject to the Construction General Stormwater Permit issued by the regional board, or would be subject to article 4.2 of the public works code. In accordance with these regulatory requirements, the Port also would be required to prepare and implement an SWPPP or erosion and sediment control plan to minimize construction-related water quality impacts.

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[251] These include the SF Electric Reliability project site at Pier 80, the Transbay Cable Converter Station, the Potrero Power Plant, Pier 70 Redevelopment, and Mission Bay Redevelopment Area. State Water Resources Control Board, GeoTracker, https://geotracker.waterboards.ca.gov/, accessed February 2, 2021.

[252] City of San Francisco, Data SF Maher map, https://data.sfgov.org/Energy-and-Environment/Maher/hqsk-4xmh, accessed February 2, 2021.

The SWPPP or the erosion and sediment control plan would identify hazardous materials sources within the construction area and recommend site-specific best management practices (i.e., stormwater controls) to prevent discharge of these materials into stormwater and bay waters. The minimum best management practices that would be required include: maintaining an inventory of materials used onsite; storing chemicals in water-tight containers protected from rain; developing a spill response plan and procedures to address hazardous and nonhazardous spills; maintaining spill cleanup equipment onsite; assigning and training spill response personnel; and preventing leaked oil, grease, and fuel from equipment from entering the storm drain or bay. Pursuant to the Construction General Stormwater Permit, the Port must ensure that the construction site is visually inspected weekly, and daily during rain events, and must implement corrective actions if any shortcomings are identified. If a discharge of pollutants to the bay were indicated, the discharge would be sampled in accordance with the General Construction Stormwater Permit.

Further, the vendors and contractors responsible for transport and delivery of hazardous materials to project sites would be required to comply with the regulations of the California Highway Patrol and Caltrans related to the transportation of hazardous materials during construction.

With implementation of these regulatory requirements, including any applicable future updates, impacts related to the routine transport, use or disposal of hazardous materials during construction of subsequent projects would be ***less than significant***.

OPERATION

Subsequent projects in the Plan area could include residential, commercial, and industrial facilities that could require the use of hazardous materials that are typical of such uses. Relatively small quantities of hazardous materials, such as cleaners, disinfectants, and chemicals for landscaping maintenance such as herbicides, would be used for routine purposes. These commercial products are labeled to inform users of potential risks and to instruct them in appropriate handling procedures. Most of these materials are consumed through use, resulting in relatively little hazardous waste. In addition, programs are in place in San Francisco to provide opportunities for residents to dispose of household hazardous waste. Retail uses also would be subject to San Francisco Health Code articles 21 and 22, implemented by the health department. As described in greater detail in Impact HZ-2, under health code articles 21 and 22, businesses are required to ensure employee safety by identifying hazardous materials in the workplace, providing safety information to workers who handle hazardous materials, and adequately training workers.

In addition, San Francisco Health Code article 21 requires any business that handles or stores hazardous materials or petroleum products above threshold quantities (i.e., 500 pounds, 55 gallons, or 200 cubic feet for compressed gasses) to comply with the requirements of the City's hazardous material handling requirements. In the event that hazardous materials use would exceed these thresholds for subsequent projects that could occur pursuant to the Waterfront Plan, adherence to these requirements would be necessary. Accordingly, subject land uses would be required to obtain a certificate of registration from the health department and implement a hazardous materials business plan that includes inventories, a program for reducing the use of hazardous materials and the generation of hazardous wastes, site layouts, a program and implementation plan for training new employees as well as annual training for all employees, and emergency response procedures and plans.

Facilities that store petroleum products in USTs would be required to obtain a permit for the UST in compliance with San Francisco Health Code article 21 and comply with the regulatory requirements for inspection,

monitoring, and secondary containment of USTs. Facilities that store petroleum products in aboveground storage tanks beyond a specified size would be required to submit a storage statement to the state board and prepare a Spill Prevention Control and Countermeasure Plan. In the unlikely event of a leak or tank rupture involving an underground or aboveground storage tank, the spill would most likely be contained within the secondary containment system for the tank. In addition, the health department implements the Risk Management and Prevention Program specified in San Francisco Health Code article 21A and requires businesses that handle regulated substances to prepare a risk management plan. Similarly, any new businesses that handle hazardous waste must comply with the City's hazardous waste handling requirements, as specified in San Francisco Health Code article 22.

Compliance with the San Francisco Health Code, which incorporates state and federal requirements, would minimize potential exposure of site personnel and the public to any accidental releases of hazardous materials or waste and protect against potential environmental contamination. In addition, the transport of hazardous materials is well regulated by the California Highway Patrol and Caltrans.

With implementation of these regulatory requirements, including any applicable future updates, impacts of the Waterfront Plan related to the routine use, transport, and disposal of hazardous materials during operation would be ***less than significant***.

Mitigation: None required.

Impact HZ-2: The Waterfront Plan would not 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. In addition, subsequent projects could occur on sites identified on the list of hazardous materials sites compiled pursuant to Government Code section 65962.5, but compliance with regulations would ensure that impacts remain less than significant. ***(Less than Significant)***

Over 60 currently active or closed hazardous materials cleanup sites are located within or adjacent to the Plan area, including multiple sites with land use restrictions. Subsequent projects that could occur pursuant to the Waterfront Plan could occur within a hazardous materials site that has been identified on a list compiled pursuant to Government Code section 65962.5 or at an otherwise contaminated site. As a result, construction activities could encounter hazardous materials in the soil and groundwater, and future site occupants, workers, and visitors could be exposed to hazardous materials. Excavated soil could require disposal as a hazardous waste, and groundwater pumped during dewatering could require treatment before being discharged. In the event that affected soil and groundwater are encountered, specific handling/disposal procedures would be required. Furthermore, occupants and workers at subsequent project sites could be exposed to hazardous materials if such materials are left in place.

The following regulations, ordinances, and programs apply to the handling of onsite hazardous materials.

Federal Resource Conservation and Recovery Act. The Resource Conservation and Recovery Act governs hazardous material disposal, ensuring that only facilities permitted to accept the specific waste are used. Transportation of hazardous materials must comply with RCRA.

Federal Hazardous Materials Transportation Act of 1975 (49 USC 5101). The U.S. Department of Transportation, in conjunction with the U.S. Environmental Protection Agency, is responsible for enforcement and implementation of federal laws and regulations pertaining to safe storage and transportation of hazardous materials. Code of Federal Regulations 49, 171–180, regulates the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials.

California Vehicle Code. The transport of hazardous materials is regulated by the California Highway Patrol under the California Vehicle Code. Specific requirements related to hazardous materials are specified in the California Code of Regulations (CCR) Title 13, Division 2, Chapter 6. These regulations specify container types, packaging requirements, and placarding requirements as well as requirements for licensing and training for truck operators and chemical handlers.

Regulatory requirements for the transport of hazardous wastes in California are specified in CCR Title 22, division 4.5, chapters 13 and 29. In accordance with these regulations, all hazardous waste transporters must have identification numbers, which are used to identify the hazardous waste handler and to track the waste from its point of origin to its final disposal disposition. This number, issued by either the USEPA or DTSC, depends on whether the waste is classified as hazardous by federal regulations or only under California regulations. Hazardous waste transporters must also comply with the California Vehicle Code, California Highway Patrol regulations (CCR Title 13). A hazardous waste manifest is required for transport of hazardous wastes. The hazardous waste manifest documents the legal transport and disposal of the waste, and is signed by the generator and transporter(s) of the waste as well as the disposal facility. California regulations specify specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

Local Oversight Program Pursuant to CCR Title 23, Division 3, Chapter 16. Under the Local Oversight Program, the health department provides oversight for sites that have experienced a release from a UST, pursuant to CCR Title 23, chapter 16. Under this program, the state board provides regulatory guidance and also reviews, comments on, and approves site assessment workplans, reports, and feasibility studies; reviews monitoring data to evaluate the effectiveness of remediation plans; and, upon completion of remediation, issues a letter or other document that certifies that the cleanup goals have been met.

Article 21 of the San Francisco Health Code provides for safe handling of hazardous materials in the city. It requires any person or business that handles, sells, stores, or otherwise uses specified quantities of hazardous materials to keep a current certificate of registration and to implement a Hazardous Materials Business Plan. A special permit is required for USTs. To close a facility (including USTs), a closure plan must be prepared that identifies how the need for future maintenance of the facility will be eliminated, how the threat to the environmental and public health and safety will be eliminated, and how all hazardous materials in the facility will be removed and appropriately disposed of. This article also requires that soil from the UST excavation, and possibly the groundwater, be sampled. Upon completion of closure, a final report documenting UST removal activities and any residual contamination left in place must be submitted to the City. Upon approval of this report, the City would issue a Certificate of Completion. If a release were indicated, the site owner would be required to assess the extent of any contamination and conduct a site remediation, as needed, in compliance with the health department's Local Oversight Program requirements. The health department could approve abandonment of the UST in place if removal were infeasible.

Article 22A of the San Francisco Health Code, also known as the Maher Ordinance, amended August 2013, requires a project sponsor to conduct a site assessment to determine the potential for site contamination and the level of exposure risk associated with the project prior to issuance of a building permit. Based on that information, the project sponsor may be required to conduct additional investigations. If the results of the additional investigations reveal the presence of hazardous substances (i.e., in excess of state or federal standards), the project sponsor would be required to submit appropriate documentation to the health department or other appropriate state or federal agencies and remediate any site contamination prior to the issuance of any building permit. For departments, boards, commissions, and agencies of the City and County of San Francisco that authorize construction or improvements on land under their jurisdiction where no building or grading permit is required, the ordinance requires protocols to be developed between the sponsor and the health department that will achieve the environmental and public health and safety goals of article 22A. Article 22A also requires testing of groundwater when contaminated groundwater is suspected.

SOIL AND GROUNDWATER CONTAMINATION

Potential impacts related to residual contamination from former hazardous material handling facilities (including USTs) would be minimized through compliance with health code article 21, which specifies procedures that must be followed when a hazardous materials handling facility is closed. Compliance would include preparation and implementation of a closure plan, along with implementation of any required sampling. Where a release is discovered, investigation and cleanup could be required under the oversight of the Local Oversight Program. In this case, a corrective action plan may be required. The health department would determine the adequacy of the plan and may request state or federal agency review. The health department findings would be published for public review. Alternatively, a UST could be abandoned in place if removal was not feasible. For subsequent projects, compliance with regulations would ensure that impacts related to development on the sites of former hazardous materials handling facilities would be ***less than significant***.

Because of the historic use of hazardous materials along the waterfront and the potential presence of hazardous materials in historic artificial fill placed in the project area, it is possible that activities associated with subsequent projects that could occur pursuant to the Waterfront Plan could encounter existing or residual contamination during grading, excavation, dewatering, or placement of foundation structures. Without implementation of proper protections, construction personnel or the surrounding community could be exposed to hazardous materials during construction activities, including excavation, grading, and dewatering, or during site investigation and remediation. Without proper engineering controls, occupants could also be exposed to hazardous materials if such materials are left in place. Select hazardous materials produce soil vapor that could accumulate in structures, causing nuisance vapors, adverse health effects, or flammable or explosive conditions. However, implementation of the requirements of the Maher Ordinance and the Local Oversight Program, described above, would ensure that impacts associated with construction within contaminated soil and groundwater would be ***less than significant***.

Where remediation or UST removal requires offsite transport of contaminated soil or groundwater, these materials could be classified as a restricted or hazardous waste under state or federal regulations, depending on the specific characteristics of the materials. However, the generator of the hazardous wastes would be required to follow state and federal regulations regarding manifesting the wastes, using licensed waste haulers, and disposing the materials at a permitted disposal or recycling facility. With implementation of these regulatory requirements, the impacts of subsequent projects related to the disposal of hazardous wastes would be ***less than significant***.

Due to the depth to groundwater in the project area (described in Section E.17, Hydrology and Water Quality), dewatering during construction may be necessary for subsequent projects. If groundwater produced during construction dewatering requires discharge to the sewer system, the discharge would be conducted in compliance with article 4.1 of the public works code, as supplemented by Order No. 158170, which specifies conditions and criteria for discharges of groundwater. This article also prohibits discharges of hazardous wastes into the combined sewer system. The discharged water would have to be sampled during dewatering to demonstrate that discharge limitations in the ordinance are met. If the groundwater does not meet discharge requirements, onsite pretreatment may be required before discharge to the sewer system. If standards cannot be met with onsite treatment, offsite disposal by a certified waste hauler would be required. Long-term dewatering could also be required to alleviate hydrostatic pressure on belowground features such as vehicular parking garages. With implementation of the regulatory requirements described above, the impacts of the Waterfront Plan related to the discharge of contaminated groundwater would be ***less than significant***.

HAZARDOUS BUILDING MATERIALS

The Plan area is a large geographic area with buildings and structures that were constructed at different times. These buildings may contain hazardous materials, such as asbestos-containing materials, lead based paint, and polychlorinated biphenyls (PCBs)[253] in electrical equipment. The buildings could also have fluorescent light ballasts with PCBs or bis(2-ethylhexyl) phthalate[254] (DEHP, or diethylhexyl phthalate) and fluorescent light tubes with mercury vapors. Piers, piling, and other in-water structures may also have been treated to creosote to reduce weathering. All of these materials were commonly employed until the second half of the 20th century. If a building is demolished or renovated as part of a subsequent project, or creosote-treated materials removed, workers and the public could be exposed to hazardous building materials if they are not abated prior to demolition. However, there is a well-established regulatory framework for the abatement of asbestos-containing materials, lead based paint, PCBs, DEHP, and creosote treated materials, as described below.

Asbestos-Containing Materials. California Health and Safety Code section 19827.5 requires local agencies not to issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The air district is vested by the California legislature with the authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement. The air district must be notified 10 days in advance of any proposed demolition or abatement work. Notification includes the following:

- The names and addresses of operators and persons responsible
- A description and the location of the structure to be demolished/altered, including size, age, and prior use
- The approximate amount of friable asbestos that would be removed or disturbed
- The scheduled starting and completion dates of demolition or abatement
- The nature of the planned work and methods to be employed

[253] PCBs are man-made organic chemicals, known as chlorinated hydrocarbons. They have been shown to cause cancer in animals as well as several serious non-cancer health effects in animals, including effects on the immune system, reproductive system, nervous system, endocrine system, and other health effects (USEPA 2017).

[254] DEHP is a manufactured chemical that is commonly added to plastics for flexibility. The Department of Health and Human Services has determined that DEHP may reasonably be anticipated to be a human carcinogen. USEPA has determined that DEHP is a probable human carcinogen (Agency for Toxic Substances and Disease Registry 2002).

- The procedures to be employed to meet air district requirements
- The name and location of the waste disposal site to be used

The air district randomly inspects asbestos removal operations. In addition, the air district will inspect any removal operation when a complaint has been received. The local office of Cal/OSHA must be notified when asbestos abatement is carried out. Asbestos abatement contractors must follow state regulations contained in CCR Title 8, sections 1529 and 341.6 through 341.17, where there is asbestos-related work involving 100 square feet or more of asbestos-containing materials. Asbestos removal contractors must be certified as such by the Contractors Licensing Board of the State of California. The owner of the property where abatement is to occur must have a Hazardous Waste Generator Number assigned by and registered with the Office of the California Department of Health Services in Sacramento. The contractor and hauler of the material are required to file a Hazardous Waste Manifest that details the transport of the material from the site and the disposal of it. Pursuant to California law, the building department would not issue the required permit until the applicant has complied with the notice and abatement requirements described above.

Lead-Based Paint. Work that could result in the disturbance of lead paint must comply with building code section 3425, Work Practices for Lead-Based Paint on Pre-1979 Buildings and Steel Structures. Where there is any work that may disturb or remove lead paint on the exterior of any building built prior to 1979, section 3425 requires specific notification and work standards. It also identifies prohibited work methods and penalties.

Section 3425 applies to the exterior of all buildings or steel structures constructed prior to 1979, which are assumed to have lead-based paint on their surfaces, unless demonstrated otherwise through laboratory analysis, as well as the interior of residential buildings, hotels, and childcare centers. The ordinance contains performance standards, including the establishment of containment barriers that are at least as effective at protecting human health and the environment as those in the U.S. Department of Housing and Urban Development Guidelines, the most recent guidelines for evaluation and control of lead-based paint hazards, and identifies prohibited practices that may not be used during disturbances or removal of lead-based paint. Any person performing work subject to the ordinance shall, to the maximum extent possible, protect the ground from contamination during exterior work, protect floors and other horizontal surfaces from work debris during interior work, and make all reasonable efforts to prevent migration of lead paint contaminants beyond containment barriers during the course of the work. Cleanup standards require the removal of visible work debris, including the use of a high-efficiency particulate air filter vacuum following interior work. The ordinance also includes notification requirements as well as requirements regarding signs, provisions regarding inspection and sampling for building department compliance, and penalties for non-compliance with the ordinance.

The demolition or renovation of structures with materials that contain lead in their interiors could expose workers and the public to lead. However, these activities would be subject to the Cal/OSHA Lead in Construction Standard (CCR Title 8, section 1532.1). This standard requires development and implementation of a lead compliance plan when materials that contain lead could be disturbed during construction. The plan must describe activities that could emit lead, the methods that would be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Cal/OSHA would require 24-hour notification if more than 100 square feet of materials that contain lead would be disturbed.

Polychlorinated Biphenyl or Diethylhexyl Phthalate. Fluorescent light ballasts can contain PCBs or DEHP. PCBs have been prohibited in most uses since 1978, although some electrical transformers still in use today

use oils that contain PCBs. USEPA has classified DEHP as a probable human carcinogen. Switches, thermostats, and fluorescent light tubes can contain mercury, which can harm the brain, kidneys, lungs, and immune systems of people. The following regulations address abatement, removal, and disposal of these hazardous building materials:

- Federal Toxic Substances Control Act of 1976 (U.S. Code, title 15, chapter 53, and 40 Code of Federal Regulations 761) provides USEPA with the authority to require reporting, record-keeping, and testing and enact restrictions related to chemical substances. The act places special attention on PCBs, asbestos, lead, and mercury. As part of the Toxic Substances Control Act, USEPA identified DEHP as a chemical that requires an action plan; DEHP is listed as a hazardous waste under federal regulations (40 Code of Federal Regulations 261.33).
- California Universal Waste Rule (22 CCR section 66261.9) identifies fluorescent tubes and bulbs and mercury-containing equipment, including thermostats and switches, as hazardous waste and regulates their disposal (22 CCR section 66261.50).

Treated Wood Waste. Treated wood waste, including creosote-treated piles, utility poles, railroad ties and structures, contain hazardous chemicals at elevated levels and can be characterized as a hazardous waste under California regulations.[255] Article 22 of the San Francisco Health Code provides for safe handling of hazardous wastes in the city. It authorizes the health department to implement state hazardous waste regulations, which would apply to treated wood waste unless the DTSC alternative management standards are followed, as described below.

The DTSC has developed alternative management standards that allow for disposal of treated wood as a nonhazardous waste. These standards, contained in CCR Title 22, division 4.5, chapter 34, simplify and facilitate the safe and economical disposal of treated wood waste. They provide for storage requirements, accumulation periods, shipment by a licensed waste hauler, and disposal at an authorized treated wood waste disposal facility. The DTSC alternative management standards specify different management requirements for households, businesses that generate treated wood waste incidental to their normal course of business, and businesses that generate treated wood waste during their normal course of business.

In accordance with these standards, employees who handle the treated wood waste or would otherwise be expected to come into contact with the waste must be trained in the applicable regulations related to the handling of treated wood waste. In addition, the standards require that treated wood waste is segregated from other wastes, appropriately stored and labeled, and transported to an authorized treated wood waste disposal facility. The DTSC standards specify that treated wood waste should not be burned, scavenged, or stored in contact with the ground and allow for disposal of the treated wood waste at authorized landfills. Likely disposal sites for the [256] Reuse of creosoted-treated pilings and structures is not allowed unless they are reused onsite, or if the use is consistent with allowable reuses for creosote-treated wood. Compliance with these standards and required procedures, or with state hazardous waste handling and disposal requirements, would ensure that potential hazardous materials-related impacts of removal of creosote-treated piles would be ***less than significant***.

[255] California Department of Toxic Substances Control, *Requirements for Generators of Treated Wood Waste (TWW, Fact Sheet)*, December 2008.
[256] Department of Toxic Substances Control, List of San Francisco Bay Regional Water Quality Control Board Approved Treated Wood Waste Landfills (DTSC July 2013 update), https://www.waterboards.ca.gov/water_issues/programs/land_disposal/treated_wood_waste.html, accessed May 5, 2021.

As discussed, asbestos-containing materials, lead-based paint, PCBs, and DEHP are likely to be present in structures throughout the Plan area, and treated wood waste may be generated with implementation of subsequent projects that could occur pursuant to the Waterfront Plan. Therefore, demolition and renovation activities at subsequent project sites would be subject to the regulations and requirements discussed above. Compliance with regulatory requirements would reduce impacts related to asbestos, lead, PCBs, DEHP, and creosote-treated structures for subsequent projects pursuant to the Waterfront Plan to ***less-than-significant*** levels.

Mitigation: None required.

Impact HZ-3: The Waterfront Plan would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. ***(Less than Significant)***

CEQA Guidelines section 15186 requires that the environmental document for projects that are located within 0.25 mile of a school address the use of extremely hazardous materials and hazardous air emissions. Certain consultation and notification requirements apply if either of these activities would result in a health or safety hazard to persons who would attend or work at a school. There are approximately 22 schools within 0.25 mile of the plan area.[257]

The State of California defines extremely hazardous materials and other regulated substances in Health and Safety Code section 25532(i). Construction of subsequent projects would likely use common hazardous materials such as paints, solvents, cements, adhesives, and petroleum products (e.g., asphalt, oil, and fuel). None of these materials is considered extremely hazardous under the state's definition. The Waterfront Plan includes goals, objectives, and policies that would encourage increased mixed use and industrial development, maritime activity, an expansion of transportation infrastructure, and increased local and visitor foot traffic to open space and recreational activity. Impacts HZ-1 and HZ-2 above describe the regulatory requirements that would ensure that hazardous materials are handled and transported safely. Therefore, there is no impact related to the use of these materials within 0.25 mile of a school during either construction or operation of subsequent projects that could occur pursuant to the Waterfront Plan.

Therefore, for the purposes of this hazardous materials analysis, impacts related to the use of extremely hazardous materials within 0.25 mile of a school would be ***less than significant***. Impacts related to construction emissions are discussed in Draft EIR Section 4.E, Air Quality.

Mitigation: None required.

Impact HZ-4: The Waterfront Plan would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. ***(Less than Significant)***

Development of subsequent projects in the Plan area could increase normal day-to-day congestion of people and vehicles in the area, potentially affecting emergency evacuation procedures. Although not adopted by

[257] City and County of San Francisco, Map of Schools, https://data.sfgov.org/Economy-and-Community/Map-of-Schools/qb37-w9se, accessed May 5, 2021.

legislative action, the City has a published Emergency Response Plan,[258] prepared by the Department of Emergency Management as part of the City's Emergency Management Program, which includes plans for hazard mitigation and disaster preparedness and recovery. The Emergency Response Plan identifies hazards to which San Francisco is particularly susceptible (e.g., earthquakes, hurricanes, tsunamis, floods, winter storms, and acts of terrorism, including the use of chemical, biological, radiological, nuclear, and explosive weapons), and contains 16 annexes (similar to appendices) that cover a number of emergency topics. The Earthquake Annex, in particular, sets forth planning assumptions for a series of earthquakes of varying magnitudes on different faults and procedures for the assessment of damage and injuries. The Waterfront Plan includes policies to reduce seismic risks to life safety and emergency response capabilities through continued seismic retrofit programs, and for the Port to work closely with the City to determine facilities and lands that may be deployed to support disaster and emergency response needs.

The Transportation Annex of the Emergency Response Plan includes operations concepts for evacuation of people in an emergency, including the process for designating evacuation routes during an emergency. The Embarcadero and Third Street are considered "primary" emergency priority routes in the Plan. Draft EIR Section 4.C, Transportation and Circulation, evaluates impacts of construction and operation of subsequent projects on emergency access. Subsequent projects would be required to include provisions for emergency response for visitors and employees at completed projects. These provisions would be integrated and be compatible with existing emergency response plans and would neither obstruct implementation of the City's Emergency Response Plan, nor interfere with emergency evacuation planning.

Subsequent projects also would be required to comply with the San Francisco or Port of San Francisco Building Codes that require buildings to be equipped with a fire protection system and constructed of noncombustible materials or with fire-resistive construction, and that structures include fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions. The final building plans would be reviewed by the Port Fire Marshal (as well as the Chief Harbor Engineer) to ensure conformance with these provisions. Subsequent projects would be subject to a building permit from the building department or Port of San Francisco, and an operational permit from the fire department that would specify requirements regarding occupancy, fire protection, and maintenance of an adequate means of egress to and from the subsequent projects.

Through compliance with the existing codes and regulations and implementation of project provisions for emergency response that account for and are compatible with the City's Emergency Response Plan, the Waterfront Plan's impacts would be ***less than significant***.

Mitigation: None required.

Impact C-HZ-1: The Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact related to hazards and hazardous materials. ***(Less than Significant)***

Impacts from hazards and hazardous materials are generally site-specific and do not result in cumulative impacts unless the cumulative projects are in close proximity to one another. Subsequent projects within the Plan area may occur adjacent to other development projects. Individual projects may undergo construction concurrently within the Plan area, including adjacent to nearby development projects.

[258] City and County of San Francisco, *Emergency Response Plan*, 2017, https://sfdem.org/sites/default/files/CCSF%20Emergency%20Response%20Plan_April%202008%20-%20updated%20May%202017_Posted.pdf, accessed May 5, 2021.

As discussed above, the Waterfront Plan would not result in any significant impacts with respect to hazards or hazardous materials during construction or operation of subsequent projects with implementation of applicable regulatory requirements for hazardous materials. All cumulative development in San Francisco would be subject to the same regulatory framework as subsequent projects that could occur pursuant to the Waterfront Plan for the transport, use, and storage of hazardous materials (Impact HZ-1), as well as work within contaminated areas and the abatement of hazardous building materials (Impact HZ-2). Implementation of the requirements of these existing regulations would serve to ensure that cumulative impacts related to these topics are ***less than significant***.

With implementation of the City's Emergency Response Plan, which provides a framework for citywide emergency planning, and compliance with the San Francisco and Port of San Francisco building codes by all projects, cumulative impacts related to interference of an emergency response plan would be ***less than significant***.

For the reasons described above, cumulative impacts related to hazards and hazardous materials would be ***less than significant***.

Mitigation: None required.

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19. Mineral Resources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
19. MINERAL RESOURCES. Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☐	☒

Pursuant to the Surface Mining and Reclamation Act of 1975, the California Division of Mines and Geology has designated all land in San Francisco, including the Waterfront Plan area, as Mineral Resource Zone 4.[259] This designation indicates that inadequate information is available to assign the site to any other mineral resource zone; thus, the Waterfront Plan area is not a designated area of significant mineral deposits. No sites in San Francisco, including the Waterfront Plan area, are designated areas of significant mineral deposits. Therefore, topics E.19(a) and 19(b) are not applicable to the Waterfront Plan.

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[259] California Department of Conservation, Division of Mines and Geology, *Update on Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region*, DMG Open-File Report 96-03, 1996.

20. Energy

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
20. ENERGY. Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

Pacific Gas & Electric provides electric service and natural gas to the Plan area. SFPUC currently provides electric service to the Plan area. With a relatively mild Mediterranean climate and strict energy-efficiency and conservation requirements, California has lower energy consumption rates than other parts of the country. According to the Department of Energy, California's per capita energy consumption was the fourth lowest in the nation as of 2018.[260]

Pacific Gas & Electric provides natural gas within an area of 70,000 square miles in northern and central California, including San Francisco and the Plan area. Pacific Gas & Electric's service area extends north to south from Eureka to Bakersfield and east to west from the Sierra Nevada to the Pacific Ocean. Pacific Gas & Electric purchases gas from a variety of sources, including other utility companies.

San Francisco is located in a coastal climate zone (Climate Zone 3 in the Title 24 climate zone designation mapping). In 2019, Pacific Gas & Electric delivered approximately 229 million therms of natural gas to San Francisco, with about 42 percent, or approximately 96 million therms of natural gas, sold to nonresidential customers.[261]

SFPUC is San Francisco's municipal power utility. SFPUC also provides electrical services to select local residential and business communities, including the Plan area. The Hetch Hetchy Power System, which is owned and operated by SFPUC, supplies clean energy to all of San Francisco's municipal facilities, services, and customers. The Hetch Hetchy Power System is composed of three hydroelectric powerhouses, with a combined total of approximately 385 megawatts. This electricity is transmitted to San Francisco along City-owned transmission lines. Within San Francisco, SFPUC also generates more than 11 megawatts of renewable energy from 27 solar arrays, one biogas cogeneration facility, and wind resources.[262]

[260] U.S. Department of Energy and U.S. Energy Information Administration, *State Profile and Energy Estimates – California*, 2018, http://www.eia.gov/state/?sid=CA, accessed May 13, 2021.
[261] California Energy Commission, *Electricity Consumption by County*, 2019, http://www.ecdms.energy.ca.gov/gasbycounty.aspx, accessed May 13, 2021.
[262] San Francisco Public Utilities Commission, *The Hetch Hetchy Power System*, https://sfpuc.org/programs/clean-energy/hetch-hetchy-power, accessed May 13, 2021.

APPROACH TO ANALYSIS

The Waterfront Plan would not immediately result in new development. The Waterfront Plan would amend and update the 1997 Plan to reflect revised or new goals, policies, and procedures and would amend the planning code to create Waterfront SUD 4. Effects on population and housing could result as subsequent projects that could add new residential, commercial, maritime, or industrial use projects.

Table 4-1, p. 4-5, in Chapter 4 of the Draft EIR presents the housing unit, population, and employment information for the Plan area in 2020 and the assumed growth in 2050. The 2020 existing conditions for the Plan area includes 410 housing units, approximately 850 residents, and approximately 12,910 jobs. Growth attributable to the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs. Therefore, the existing conditions plus growth assumed with implementation of the Waterfront Plan would total approximately 670 housing units, approximately 1,380 residents, and approximately 27,700 jobs.

This analysis considers to what extent implementation of the Waterfront Plan would generate a demand for energy and water and whether such demand would be wasteful. The existing state and local regulatory environment was evaluated to determine requirements for new structures that could occur pursuant to the Waterfront Plan. These requirements (e.g., LEED®, GreenPoint) are well established in the industry as standards for efficient building practices.

IMPACTS AND MITIGATION MEASURES

Impact EN-1: The Waterfront Plan would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation; or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. ***(Less than Significant)***

Over the past 15 years, several federal, state, and citywide policies and measures have been enacted to promote energy efficiency and reduce current demands on non-renewable resources. The federal Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, pursuant to the act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, buying hybrid vehicles, building energy-efficient buildings, and improving the energy efficiency of commercial buildings. In addition, tax credits are available for the installation of qualified fuel cells, stationary micro-turbine power plants, and solar power equipment.

SB 1389, passed in 2002, requires the California Energy Commission to develop an integrated energy plan biannually for electricity, natural gas, and transportation fuels. The 2020 Integrated Energy Policy Report identifies actions the state and others can take to ensure a clean, affordable, and reliable energy system.[263] Volume I of the report focuses on California's transportation future and the transition to zero-emission vehicles. Volume II examines microgrids[264] and their potential to contribute to a clean and resilient energy

[263] California Energy Commission, *2020 Integrated Energy Policy Report*, https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2020-integrated-energy-policy-report-update, accessed May 13, 2021.

[264] A *microgrid* is a self-sufficient energy system that serves a discrete geographic footprint, such as a college campus, hospital complex, business center, or neighborhood. Within microgrids are one or more kinds of distributed energy (e.g., solar panels, wind turbines, combined heat and power, generators) that produce its power.

system. Volume III reports on California's energy demand outlook and is updated to reflect the global COVID-19 pandemic and to help plan for a growth in zero-emissions plug-in electric vehicles.

California's Building Energy Efficiency Standards, set forth in CCR Title 24, part 6, govern all aspects of building construction. Included in part 6 of the code are standards mandating energy efficiency measures in new construction. Since its establishment in 1977, the building efficiency standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas usage and costs in California. The standards are updated every 3 years to incorporate new energy efficiency technologies. The latest update to the Title 24 standards became effective on January 1, 2020, and reflect the California Building Standards Commission–approved 2019 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.[265] The standards regulate energy consumed in buildings for heating, cooling, ventilation, water heating, and lighting. Title 24 is implemented through the local planning and permit process. Subsequent projects that could occur pursuant to the Waterfront Plan would adhere to the above regulations and standards to significantly reduce energy and fuel use during construction as well as operation.

San Francisco adopted a Green Building Code in 2008; in 2010, it adopted California's Green Building Standards Code (CALGreen), with modifications. The current code is the 2019 San Francisco Green Building Code, which combines all mandatory elements of the 2019 CALGreen regulations as well as stricter local requirements.[266] Applicants who apply for a building permit must conform to the San Francisco Green Building Code. Under San Francisco Environment Code chapter 7, municipal projects of 10,000 square feet or larger are required to obtain LEED® Gold certification. For those projects, the permit applicant must provide submittal documentation showing that the building will meet LEED® Gold certification requirements. The 2019 San Francisco Green Building Code also requires building permit submittals to show that they meet the compliance margin required by the applicable rating system and the California Building Energy Efficiency Standards in effect at the time of permit submittal. California Building Energy Efficiency Standards documentation must be prepared using software from the California Energy Commission's List of Approved Computer Programs for the Building Energy Efficiency Standards. Buildings that meet a LEED® for Building Design and Construction standard or LEED® Core and Shell standard must prepare and submit all standard documentation required by the California Energy Commission to demonstrate compliance with the California Building Energy Efficiency Standards (Title 24, part 6) in effect on the date of permit application. LEED® certification requires larger commercial buildings to generate renewable energy onsite; improve energy efficiency by 10 percent beyond Title 24, part 6; or purchase renewable energy credits.

The Waterfront Plan would not immediately result in new development and therefore would not result in the wasteful consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency because the policies in the Plan would have no immediate effect on the environment. The Waterfront Plan also includes goals to promote green building in Port leasing and development, particularly with regard to the adaptive reuse of existing buildings to retain the structure's embodied energy. Subsequent projects that could occur pursuant to the Plan could result in impacts related to the consumption of energy resources by enabling future development that would result in demands on these resources. However, any subsequent project would be infill development near existing modes of public transportation, existing water supplies, and existing water supply and energy infrastructure. Furthermore, subsequent projects would be subject to the most current energy and water efficiency standards in effect at

[265] California Energy Commission, 2016 Building Energy Efficiency Standards, 2018, http://www.energy.ca.gov/title24/2016standards/, accessed May 13, 2021.
[266] City and County of San Francisco, Green Building: Submittal Instructions, per AB-093 (updated January 1, 2017), 2017, http://sfdbi.org/sites/default/files/IS%20GB-01.pdf, accessed May 13, 2021.

the time the projects are proposed. Implementation of the Waterfront Plan would not result in the wasteful, inefficient, or unnecessary consumption of energy resources, large amounts of energy resources would not be used during construction or operation, and conflicts with or obstruction of a state or local plan for renewable energy or energy efficiency would not occur. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact C-EN-1: The Waterfront Plan, in combination with cumulative projects, would not result in significant cumulative impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. ***(Less than Significant)***

The geographic context for the analysis of cumulative impacts associated with energy is the city. Development of cumulative projects will use energy resources. Projects developed in the city, including subsequent projects that could be implemented in the Plan area, would be subject to the most current energy and water efficiency standards in effect at the time the projects are proposed. Conformance with these requirements would result in less-than-significant impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources. Conformance with these requirements also would ensure adherence to state or local plans for renewable energy or energy efficiency on a project level. Because the city is almost entirely built out, cumulative projects would be infill projects, making best use of limited space. Therefore, the Waterfront Plan, in combination with cumulative projects, would not result in a significant cumulative impact, and this impact would be ***less than significant***.

Mitigation: None required.

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21. Agriculture and Forestry Resources

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
21. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, 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 or 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 forest land to non-forest use?	☐	☐	☐	☐	☒

The Waterfront Plan area does not contain any prime farmland, unique farmland, farmland of statewide importance, forest, or timberlands; does not support agricultural or timber uses; is not zoned for agricultural or timber uses; and is not under a Williamson Act contract.[267,268] Because the Waterfront Plan area does not contain agricultural uses or forest land and is not zoned for such uses, the Plan would not result in the conversion of farmland to non-agricultural use or forest land to non-forest use. Therefore, none of the

[267] California Department of Conservation, California Important Farmland Finder, https://maps.conservation.ca.gov/DLRP/CIFF/, accessed February 2, 2021.

[268] The Williamson Act is a California law enacted in 1965 that provides property tax relief to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or converted into another use. The City and County of San Francisco does not offer Williamson Act contracts.

agriculture and forest resources significance criteria is applicable to the Waterfront Plan, and these topics are not discussed further.

22. Wildfire

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
22. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plans?	☐	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☐	☒
d) Expose people or structure to significant risks including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☐	☒

San Francisco County does not contain any state responsibility area land or lands classified as very high fire severity zones.[269] There are no landslide-prone areas in the immediate vicinity of the Waterfront Plan.[270] Therefore, none of the wildfire significance criteria are applicable to the Waterfront Plan, and these topics are not discussed further. Refer to Section E.17, Hazards and Hazardous Materials, for a discussion of wildland fire risks.

[269] California Department of Forestry and Fire Protection (CAL FIRE), San Francisco County Fire Hazard Severity Zone (FHSZ) Map, November 2008, https://osfm.fire.ca.gov/media/6791/fhszl06_1_map38.pdf, accessed February 2, 2021.
[270] City and County of San Francisco, *Community Safety, an Element of the General Plan of the City and County of San Francisco*, Map 04, October 2012.

23. Mandatory Findings of Significance

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
23. MANDATORY FINDINGS OF SIGNIFICANCE. Does the project:					
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐	☐
b) Have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☒	☐	☐	☐	☐
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐	☐

NOTE: Authority cited: Public Resources Code sections 21083 and 21083.05, 21083.09. Reference: Section 65088.4, Gov. Code; Public Resources Code sections 21073, 21074, 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21080.3.1, 21080.3.2,21082.3, 21084.2, 21084.3, 21093, 21094, 21095, and 21151; *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

The Waterfront Plan could result in adverse impacts on the environment related to aesthetics, historic architectural resources, transportation and circulation, noise, air quality, and biological resources. These topics are further analyzed in the Draft EIR. Mitigation measures have been included in this initial study to reduce potential impacts related to tribal cultural resources, wind, paleontological resources, and water quality to a less-than-significant level.

The Waterfront Plan would not have significant cumulative impacts on topics that are fully analyzed in this initial study, as discussed under each applicable environmental topic. A cumulative impact analysis for those topics not addressed in this initial study is provided in the Draft EIR.

Potential adverse effects on human beings have been considered as a part of the analysis of individual environmental topics in this initial study. The Waterfront Plan would not result in environmental impacts that would have substantial adverse effects on humans. A discussion of effects on human beings for those topics not addressed in this initial study is provided in the Draft EIR.

F. Mitigation Measures

The following mitigation measures have been identified in this initial study to reduce potentially significant impacts resulting from the Waterfront Plan to less-than-significant levels. The Port has agreed to implement all mitigation measures identified in the initial study.

Mitigation Measure M-CR-2a: Procedures for Accidental Discovery of Archeological Resources. The following mitigation measure shall be implemented for any projects for which the preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff identifies the potential for significant archeological impacts.

All plans and reports prepared by the qualified archeologist (hereinafter, "project archeologist"), as specified herein and in the subsequent measures, shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

ALERT Sheet. The project sponsor shall distribute the Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils-disturbing activities within the project site. Prior to any soils-disturbing activities being undertaken, each contractor is responsible for ensuring that the "ALERT" sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The project sponsor shall provide the Environmental Review Officer (ERO) with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) confirming that all field personnel involved in soil-disturbing activities have received copies of the Alert Sheet.

Procedures upon Discovery of a Potential Archeological Resource. The following measures shall be implemented in the event of an archeological discovery during project soil-disturbing activities:

- *Discovery Stop Work and ERO Notification.* Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project, the project sponsor shall immediately notify the ERO and shall immediately suspend any soils-disturbing activities in the vicinity of the discovery and protect the find in place until the ERO has determined what additional measures should be undertaken, as detailed below.
- *Project Archeologist.* If the ERO determines that the discovery may represent a significant archeological resource, the Port/project sponsor shall retain the services of a project archeologist; that is, one who meets the Secretary of the Interior's Professional Qualification Standards,[271] and who has demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American deposits and/or in the identification and treatment of 19th century archeological resources, including maritime

[271] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

resources as applicable, to examine and preliminary evaluate the significance and historic integrity of the resource.

The project sponsor shall ensure that the project archeologist or designee is empowered, for the remainder of soil disturbing project activity, to halt soil disturbing activity in the vicinity of potential archeological finds, and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.

- *Resource Evaluation and Treatment Determination.* The project archeologist shall examine and appropriately document the discovered resource and make a recommendation to the ERO as to what further actions, if any, are warranted. Based on this information, the ERO may require the project sponsor to implement specific treatment measures to address impacts to the resource. Treatment measures might include preservation in situ of the archeological resource (the preferred mitigation; see below); an archeological monitoring program; an archeological testing program; archeological data recovery; and/or an archeological interpretation program, as detailed below. If an archeological interpretive, monitoring, and/or testing program are required, these shall be consistent with the Environmental Planning Division guidelines for such programs and shall be implemented immediately in accordance with the archeological monitoring and testing protocols set forth in Mitigation Measures M-CR-2b, Archeological Monitoring; M-CR-2c, Archeological Testing; and/or M-CR-2d, Submerged or Deeply Buried Resources, as detailed in the Waterfront Plan EIR MMRP. The ERO may also require that the project sponsor immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions. In addition, the ERO shall notify any tribal representatives who responded to the project tribal cultural resources notification and requested to be notified of the discovery of Native American archeological resources and to coordinate on the treatment of archeological and tribal cultural resources.
- *Archeological Site Records.* At the conclusion of assessment, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.
- *Submerged Paleosols.* Should a submerged paleosol be identified the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for environmental reconstruction, irrespective of whether cultural material is present.
- *Preservation in Place Consideration.* Should a significant archeological resource be discovered during construction or during archeological testing or monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s), if requested, to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If based on this consultation the ERO determines that preservation in place would be both feasible and effective, based on this consultation, then the project archeologist, in consultation with the tribal representative, if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological

resources, the CRPP shall explicitly take into consideration the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as design of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port/project sponsor shall ensure that the approved plan is implemented during and after construction. If, based on this consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out, as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

- *Coordination with Descendant Communities.* On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.
- *Compensation.* Tribal representatives or other descendant community representatives for archeological resources or tribal cultural resources, who participate in the project, shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. The project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeological consultant, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, if requested, shall consult on the scope of the data recovery program. The project archeologist shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not

be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

If archeological data recovery is required, the archeological data recovery program required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction may be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less-than-significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a) and (c).

The ADRP shall include the following elements:

- Field Methods and Procedures: Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis: Description of selected cataloguing system and artifact analysis procedures.
- Discard and Deaccession Policy: Description of and rationale for field and post-field discard and deaccession policies.
- Security Measures: Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- Final Report: Description of proposed report format and distribution of results.
- Public Interpretation: Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with project sponsor
- Curation: Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, the following measures shall be implemented to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both archeological consultants and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the archeological consultant for the subsequent project shall consult with the prior archeological consultant, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research

questions; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. If human remains or suspected human remains are encountered during construction, the contractor and project sponsor shall ensure that ground-disturbing work within 50 feet of the remains is halted immediately and shall arrange for the protection in place of the remains until appropriate treatment and disposition have been agreed upon and implemented in accordance with this section. The treatment of any human remains and funerary objects discovered during any soils disturbing activity shall comply with applicable state laws, including Health and Safety Code section 7050.5 and Public Resources Code section 5097.98. Upon determining that the remains are human, the project archeologist shall immediately notify the Medical Examiner of the City and County of San Francisco of the find. The archeologist shall also immediately notify the ERO and the project sponsor of the find. In the event of the Medical Examiner's determination that the human remains are Native American in origin, the Medical Examiner will notify the California State Native American Heritage Commission (NAHC) within 24 hours. The NAHC will immediately appoint and notify a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of State law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. If significance resources are encountered, the project archeologist shall submit a confidential draft Archeological Resources Report (ARR) to the ERO that evaluates the California Register significance of any discovered archeological resource, describes the archeological and historic research methods employed in the archeological program(s) undertaken and the results and interpretation of analyses, and discusses curation arrangements.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. If archeological data recovery is undertaken, the project archeologist and the project sponsor shall ensure that any significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port or project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2b: Archeological Monitoring Program. If required based on the outcome of preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff, the project sponsor shall retain the services of a project archeologist (hereinafter 'project archeologist), to develop and implement an archeological monitoring program and to address any archeological discoveries, as detailed below, to avoid and mitigate any potential adverse effect from the proposed action on significant archeological resources found during construction.

Qualified Archeologist. A qualified archeologist (hereinafter, "project archeologist") is defined as one who meets the Secretary of the Interior's Professional Qualification Standards,[272] and who has demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American deposits and/or in the identification and treatment of 19th century archeological resources, including maritime resources as applicable.

Construction Crew Archeological Awareness. Prior to any soils-disturbing activities being undertaken, the Port shall ensure that the project archeologist conducts a brief on-site archeological awareness training. Training shall include a description of the types of resources that might be encountered and how they might be recognized, and requirements and procedures for work stoppage, resource protection and notification in the event of a potential archeological discovery. The project archeologist also shall coordinate with the project sponsor to ensure that all field personnel involved in soil disturbing activities, including machine operators, field crew, pile drivers, supervisory personnel, etc., have received an "Alert" wallet card that summarizes stop work requirements and provides necessary contact information for the project archeologist, project sponsor and the ERO. The project archeologist shall repeat the training at intervals during construction, as determined necessary by the ERO, including when new construction personnel start work and prior to periods of soil disturbing work when the project archeologist will not be on site.

Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project in the absence of the project archeologist, the project sponsor shall immediately notify the project archeologist, and shall immediately suspend any soils-disturbing activities in the vicinity of the discovery until the project archeologist has inspected the find and, in consultation with the ERO as needed, has determined what additional measures should be undertaken.

Tribal Cultural Resources Sensitivity Training. In addition to and concurrently with the archeological awareness training, for sites at which the ERO has determined that there is the potential for the discovery of Native American archeological resources, and if requested by a tribe pursuant to the department's tribal cultural resources notification process, the Port shall ensure that a Native American representative is afforded the opportunity to provide a Native American cultural resources sensitivity training to all construction personnel.

General Specifications. The archeological consultant shall develop and undertake an archeological monitoring program as specified herein. In addition, the consultant shall be available to conduct an

[272] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

archeological testing and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure.

The project archeologist's work shall be conducted in accordance with this measure at the direction of the ERO. All plans and reports prepared by the project archeologist as specified herein shall be submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

The project sponsor shall ensure that the project archeologist or designee is empowered to halt soil disturbing activity in the vicinity of a potential archeological find and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.

Archeological testing and/or data recovery programs required to address archeological discoveries, pursuant to this measure, could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a)(c).

Archeological Monitoring Program. Based on the results of information provided in the preliminary archeological review and additional historic research as needed, the project archeologist shall consult with the ERO reasonably prior to the commencement of any project-related soils disturbing activities to determine what soil-disturbing project activities shall be archeologically monitored, and at what intensity, based on the specifics of anticipated soil disturbance for project construction, past development history, and the assessed risk these activities pose to undiscovered archeological resources and their depositional context. The archeological monitoring program shall be set forth in an Archeological Monitoring Plan (AMP), as detailed below.

The project archeologist or delegee ("Archeological Monitor") shall be present on the project site according to a schedule agreed upon by the project archeologist and the ERO until the ERO has, in consultation with the project archeologist, determined that project construction activities could have no effects on significant archeological deposits. The archeological monitor(s) shall prepare a daily monitoring log documenting activities and locations monitored, soil disturbance depth, stratigraphy and findings.

The project sponsor shall authorize the archeological monitor to stop soil disturbing construction activity temporarily in the vicinity of a suspected find, to document the resource, collect samples as needed, and assess its significance. The project sponsor shall ensure that the find is protected in place in accordance with the archeologist's direction, and that it remains protected until the archeologist, after consultation with the ERO, notifies the sponsor that assessment and any subsequent mitigation are complete. The sponsor shall also ensure that the construction foreperson or other on-site delegee, is aware of the stop work and protection requirements.

In the event of a discovery of a potentially significant archeological resources during monitoring or construction, the project archeologist shall conduct preliminary testing of the discovery, including the collection of soil samples and artifactual/ ecofactual material, as needed to assess potential significance and integrity. Once this initial assessment has been made, the project archeologist shall consult with the ERO on the results of the assessment. If the resource is assessed as potentially

significant, the Port/ project sponsor shall ensure that soil disturbance remains halted at the discovery location until appropriate treatment has been determined in consultation with the ERO and implemented, as detailed below.

Archeological Monitoring Plan. The archeological monitoring plan, minimally, shall include the following provisions:

- Project description: Description of all anticipated soil disturbing activities, with locations and depths of disturbance. These may include foundation and utility demolition, hazardous soils remediation, site grading, shoring excavations, piles or soil improvements, and foundation, elevator, car stacker, utility and landscaping excavations. Project plans and profiles shall be included as needed to illustrate the locations of anticipated soil disturbance.
- Site-specific environmental and cultural context: Pre-contact and historic environmental and cultural setting of the project site as pertinent to potential Native American use and historic period development; any available information pertaining to subsequent soil disturbance as pertains to potential survival of archeological resources, strata in and depths at which they might be found. As appropriate based on the scale and scope of the project, the AMP should include maps (e.g., USCS 1869; Sanborn fire insurance maps) that depict the historic and environmental setting and changes in the project site, as a basis for predicting resource types that might be encountered and their potential locations. An overlay of the project site on the City's Native American archeological sensitivity model mapping should be included, as should the locations of all known archeological sites within ¼ mile of the project site.
- Analysis of anticipated resources or resource types that might be encountered and at what locations and depths, based on known resources in the vicinity, the site's predevelopment setting and development history, and the anticipated depth and extent of project soil disturbances.
- Proposed scope of archeological monitoring, including soil-disturbing activities/ disturbance depths to be monitored.
- Synopsis of discovery procedures, ERO and Native American consultation requirements upon making a discovery; burial treatment procedures; and reporting and curation requirements, consistent with the other specifications of this measure.

Resource Evaluation and Treatment Determination. If an archeological deposit or feature is encountered during construction, the archeological monitor shall redirect soil disturbing demolition/ excavation/ piledriving/ construction crews and heavy equipment activity in the vicinity away from the find. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the project sponsor shall ensure that pile driving is halted until an appropriate evaluation of the resource has been made.

The project archeologist shall document the find, and make a reasonable effort to assess its identity, integrity, and significance of the encountered archeological deposit through, sampling or testing as needed. The project sponsor shall make provisions to ensure that the project archeologist can safely enter the excavation, if feasible.

If upon examination the project archeologist determines the find appears to be a potentially significant archeological resource, the project archeologist shall present the findings of this assessment to the ERO. The project sponsor shall ensure that the find is protected until the ERO has

been consulted and has determined appropriate subsequent treatment in consultation with the project archeologist and the treatment has been implemented, as detailed below.

All Native American archeological deposits, irrespective of level of disturbance, shall be assumed to be significant until and unless determined otherwise in consultation with the ERO. If a Native American archeological deposit is encountered, the project archeologist shall obtain the services of a Native American tribal representative to participate in any future archeological monitoring, assessment or data recovery activities that may affect that resource. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources. Further the project archeologist shall offer a Native American representative the opportunity to monitor any subsequent soil disturbing activity that could affect the find.

Submerged Paleosols. Should a submerged paleosol be identified, the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for environmental reconstruction, irrespective of whether cultural material is present.

Archeological Site Records. At the conclusion of assessment of any discovered resources, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.

Preservation in Place Consideration. Should a significant archeological resource be discovered during construction or during archeological monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s) if requested to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If based on this consultation the ERO determines that preservation in place would be both feasible and effective, then the project archeologist, in consultation with the tribal representative if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological resources, the CRPP shall explicitly take into consideration the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as design of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port shall ensure that the approved plan is implemented during and after construction. If, based on this consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out, as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

Coordination with Descendant Communities. On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.

Compensation. Tribal representatives or other descendant community representatives for archeological resources or tribal cultural resources who participate in the project shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. The project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeologist, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, if requested, shall consult on the scope of the data recovery program. The project archeologist shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain; that is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

The ADRP shall include the following elements:

- Field Methods and Procedures. Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis. Description of selected cataloguing system and proposed types of analyses to be conducted based on anticipated material types.
- Discard and deaccession policy. Description of and rationale for field and post-field discard and deaccession policies.

- Security measures. Recommended security measures to protect the archeological resource from vandalism, looting, and accidental damage.
- Final report. Description of report format and distribution.
- Public interpretation. Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with the project sponsor.
- Curation. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, the following measures shall be implemented, to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both project archeologists and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the project archeologist for the subsequent project shall consult with the prior project archeologist, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; avoid redundant work and maximize the benefits of additional data recovery; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. The treatment of human remains and funerary objects discovered during any soil-disturbing activity shall comply with applicable State and federal laws. This shall include immediate notification of the Medical Examiner of the City and County of San Francisco. The ERO also shall be notified immediately upon the discovery of human remains. In the event of the Medical Examiner's determination that the human remains are Native American remains, the Medical Examiner shall notify the California State Native American Heritage Commission, which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)).

The project sponsor and ERO shall make all reasonable efforts to develop a Burial Agreement ("Agreement") with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and associated or unassociated funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). The Agreement shall take into consideration the appropriate

excavation, removal, recordation, scientific analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. If the MLD agrees to scientific analyses of the remains and/or associated or unassociated funerary objects, the archeological consultant shall retain possession of the remains and associated or unassociated funerary objects until completion of any such analyses, after which the remains and associated or unassociated funerary objects shall be reinterred or curated as specified in the Agreement.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of State law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative

elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the monitoring program to the ERO. If significant resources were found, the report shall also describe any archeological testing and data recovery efforts and results, and evaluation of the California Register and tribal significance of any discovered archeological resource. It shall also describe the research design, archeological and historic research methods employed, analytical results and interpretations, and if applicable, curation arrangements. Daily monitoring logs and formal site recordation forms (CA DPR 523 series) shall be attached to the ARR as an appendix.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one (1) bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port or project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2c: Archeological Testing Program. If required based on the outcome of preliminary archeological review conducted by qualified San Francisco Planning Department archeological staff, the Port/ project sponsor shall retain the services of a qualified archeologist (hereinafter "project archeologist"), to develop and implement an archeological testing program and to address any archeological discoveries, as detailed below, to avoid and mitigate any potential substantial adverse effects from the proposed action on significant archeological resources found during construction.

Project Archeologist. A project archeologist is defined as one who meets the Secretary of the Interior's Professional Qualification Standards,[273] and who has demonstrable experience, as applicable based on the resource type discovered or suspected, in the geoarcheological identification of submerged Native American archeological deposits and/or in the identification and treatment of 19th century archeological resources, including maritime resources as applicable.

Construction Crew Archeological Awareness. Prior to any soils-disturbing activities being undertaken, the Port shall ensure that the project archeologist conducts a brief on-site archeological awareness training. Training shall include a description of the types of resources that might be encountered and how they might be recognized, and requirements and procedures for work stoppage, resource protection and notification in the event of a potential archeological discovery. The project archeologist also shall coordinate with the project sponsor to ensure that all field personnel involved in soil disturbing activities, including machine operators, field crew, pile drivers, supervisory personnel, etc., have received an "Alert" wallet card that summarizes stop work requirements and provides necessary contact information for the project archeologist, project sponsor and the ERO. The project archeologist shall repeat the training at intervals during construction, as determined necessary by the ERO, including when new construction personnel start work and prior to periods of soil disturbing work when the project archeologist will not be on site.

Should any indication of an archeological resource be encountered during any soils-disturbing activity of the project in the absence of the project archeologist, the project sponsor shall immediately suspend any soils-disturbing activities in the vicinity of the discovery and notify the project archeologist, and shall ensure that the find is protected until a project archeologist has inspected it and, in consultation with the ERO as needed, has determined what additional measures should be undertaken. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources.

Tribal Cultural Resources Sensitivity Training. In addition to and concurrently with the archeological awareness training, for sites at which the ERO has determined that there is the potential for the discovery of Native American archeological resources, and if requested by a tribe pursuant to the department's tribal cultural resources notification process, the Port shall ensure that a Native American representative is afforded the opportunity to provide a Native American cultural resources sensitivity training to all construction personnel.

General Specifications. The archeological consultant shall develop and undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure.

The project archeologist's work shall be conducted in accordance with this measure at the direction of the ERO. All plans and reports prepared by the project archeologist as specified herein shall be

[273] 36 SFR 61: The minimum professional qualifications in Archeology are a graduate degree in archeology, anthropology, or closely related field plus: • At least one year of full-time professional experience or equivalent specialized training in archeological research, administration or management; • At least four months of supervised field and analytical experience in general North American archeology; and • Demonstrated ability to carry research to completion. In addition to these minimum qualifications, a professional in prehistoric archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the prehistoric period. A professional in historic archeology shall have at least one year of full-time professional experience at a supervisory level in the study of archeological resources of the historic period.

submitted first and directly to the ERO for review and comment and shall be considered draft reports subject to revision until final approval by the ERO.

The project sponsor shall ensure that the project archeologist or designee is empowered to halt soil disturbing activity in the vicinity of a potential archeological find and that work shall remain halted until the discovery has been assessed and a treatment determination made, as detailed below.

Archeological testing and/or data recovery programs required by this measure could suspend construction of the project for up to a maximum of four weeks. At the direction of the ERO, the suspension of construction can be extended beyond four weeks only if such a suspension is the only feasible means to reduce to a less than significant level potential effects on a significant archeological resource as defined in CEQA Guidelines section 15064.5(a)(c).

Archeological Testing Program. The archeological consultant shall develop and undertake an archeological testing program as specified herein. In addition, the consultant shall be available to conduct an archeological monitoring and/or data recovery program if required to address archeological discoveries or the assessed potential for archeological discoveries, pursuant to this measure. The purpose of the archeological testing program will be to determine to the extent possible the presence or absence of archeological resources in areas of project soil disturbance and to identify and to evaluate whether any archeological resource encountered on the site constitutes an historic resource under CEQA.

Archeological Testing Plan (ATP). The project archeologist shall consult with the ERO reasonably prior to the commencement of any project-related soils disturbing activities to determine the appropriate scope of archeological testing. The archeological testing program shall be conducted in accordance with an approved ATP, prepared by the project archeologist consistent with the approved scope of work. The ATP shall be submitted first and directly to the ERO for review and comment and shall be considered a draft subject to revision until final approval by the ERO. Project-related soils disturbing activities shall not commence until the testing plan has been approved and any testing scope to occur in advance of construction has been completed. The project archeologist shall implement the testing as specified in the approved ATP prior to and/or during construction.

The ATP, minimally, shall include the following:

- Project description: Description of all anticipated soil disturbing activities, with locations and depths of disturbance. These may include foundation and utility demolition, hazardous soils remediation, site grading, shoring excavations, piles or soil improvements, and foundation, elevator, car stacker, utility and landscaping excavations. Project plans and profiles shall be included as needed to illustrate the locations of anticipated soil disturbance.
- Site-specific environmental and cultural context: Pre-contact and historic environmental and cultural setting of the project site as pertinent to potential Native American use and historic period development, any available information pertaining to subsequent soil disturbance as pertains to potential survival of archeological resources, and strata in and depths at which they might be found, such as stratigraphic and water table data from prior geotechnical testing. As appropriate based on the scale and scope of the project, the ATP should include maps (e.g., USCS 1869; Sanborn fire insurance maps) that depict the historic and environmental setting and changes in the project site as a basis for predicting resource types that might be encountered and their

potential locations. An overlay of the project site on the City's Native American archeological sensitivity model mapping should be included, as should the locations of all known archeological sites within 0.25 mile of the project site.

- Brief research design: scientific/historic research questions applicable to the expected resource(s), what data classes potential resources may be expected to possess, and how the expected data classes would address the applicable research questions.
- Analysis of anticipated resources or resource types that might be encountered and at what locations and depths, based on known resources in the vicinity, the site's predevelopment setting and development history, and the anticipated depth and extent of project soil disturbances.
- Proposed scope of archeological testing and rationale: testing methods to be used (e.g., coring, mechanical trenching, manual excavation, or combination of methods); locations and depths of testing in relation to anticipated project soil disturbance; strata to be investigated; any uncertainties on stratigraphy that would affect locations or depths of tests and might require archeological monitoring of construction excavations subsequent to testing.
- Resource documentation and significance assessment procedures. ERO and Native American consultation requirements upon making a discovery; pre-data recovery assessment process, consistent with the specifications of this measure
- Standard text on burial treatment procedures; and
- Reporting and curation requirements.

Archeological Testing Results Memo. Irrespective of whether archeological resources are discovered, the archeological consultant shall submit a written summary of the findings to the ERO at the completion of the archeological testing program. The findings report/memo shall describe each resource, provide an initial assessment of the integrity and significance of encountered archeological deposits encountered during testing, and provide recommendations for subsequent treatment of any resources encountered.

Resource Evaluation and Treatment Determination. If an archeological deposit or feature is encountered during testing or subsequent construction soil disturbance, the project archeologist shall redirect soil disturbing demolition/ excavation/ piledriving/ construction crews and heavy equipment activity in the vicinity away from the find. If in the case of pile driving activity (foundation, shoring, etc.), the archeological monitor has cause to believe that the pile driving activity may affect an archeological resource, the project sponsor shall ensure that pile driving is halted until an appropriate evaluation of the resource has been made.

The project archeologist shall document the find, and make a reasonable effort to assess its identity, integrity, and significance of the encountered archeological deposit through, sampling or testing as needed. The project sponsor shall make provisions to ensure that the project archeologist can safely enter the excavation, if feasible.

If upon examination the project archeologist determines the find appears to be a potentially significant archeological resource, the project archeologist shall present the findings of this assessment to the ERO. The project sponsor shall ensure that the find is protected until the ERO has

been consulted and has determined appropriate subsequent treatment in consultation with the project archeologist and the treatment has been implemented, as detailed below.

All Native American archeological deposits, irrespective of level of disturbance, shall be assumed to be significant until and unless determined otherwise in consultation with the ERO. If a Native American archeological deposit is encountered, the project archeologist shall obtain the services of a Native American tribal representative to participate in any future archeological monitoring, assessment or data recovery activities that may affect that resource. In addition, the ERO shall notify any tribal representatives who requested to be notified of the discovery of Native American archeological resources in response to the project notification, to coordinate on the treatment or archeological and tribal cultural resources. Further the project archeologist shall offer a Native American representative the opportunity to monitor any subsequent soil disturbing activity that could affect the find.

Submerged Paleosols. Should a submerged paleosol be identified, the project archeologist shall extract and process samples for dating, flotation for paleobotanical analysis, and other applicable special analyses pertinent to identification of possible cultural soils and for were environmental reconstruction, irrespective of whether cultural material is present.

Archeological Site Records. At the conclusion of assessment of any discovered resources, the project archeologist shall prepare an archeological site record or primary record (DPR 523 series) for each resource evaluated as significant or potentially significant. In addition, a primary record shall be prepared for any Native American isolate. Each such record shall be accompanied by a map and GIS location file. Records shall be submitted to the department for review as attachments to the archeological resources report (see below) and once approved by the ERO, to the Northwest Information Center.

Preservation in Place Consideration. Should a significant archeological resource be discovered during construction or during archeological testing or monitoring, preservation in place is the preferred treatment option. The ERO shall consult with the project sponsor and, for Native American archeological resources, with the tribal representative(s) if requested, to consider (1) the feasibility of permanently preserving the resource in place and (2) whether preservation in place would be effective in preserving both the archeological values and (if applicable) the tribal values represented. If, based on this consultation, the ERO determines that preservation in place is determined to be both feasible and effective, then the project archeologist, in consultation with the tribal representative if a Native American archeological resource, shall prepare a Cultural Resources Preservation Plan (CRPP). For Native American archeological resources, the CRPP shall explicitly address the cultural significance of the tribal cultural resource to the tribes. Preservation options may include measures such as redesign of the project layout to place open space over the resource location; foundation design to avoid the use of pilings or deep excavations in the sensitive area; a plan to expose and conserve the resource and include it in an on-site interpretive exhibit; and/or establishment of a permanent preservation easement. The project archeologist shall submit a draft CRPP to the department and the tribes for review and approval, and the Port/project sponsor shall ensure that the approved plan is implemented during and after construction. If, based on consultation, the ERO determines that preservation in place is infeasible, archeological data recovery and public interpretation of the resource shall be carried out as detailed below. The ERO in consultation with the project archeologist shall also determine if additional treatment is warranted, which may include additional testing and/or construction monitoring.

Coordination with Descendant Communities. On discovery of an archeological site associated with descendant Native Americans, Chinese, or other potentially interested descendant group, the project archeologist shall contact an appropriate representative of the descendant group and the ERO. The representative of the descendant group shall be offered the opportunity to monitor archeological field investigations of the site and to offer recommendations to the ERO regarding appropriate archeological treatment of the site and data recovered from the site, and, if applicable, any interpretative treatment of the site. The project archeologist shall provide a copy of the Archeological Resources Report (ARR) to the representative of the descendant group.

Compensation. Tribal representatives or other descendant community representatives for archeological or tribal cultural resources who participate in the project shall be compensated for time invested in the preparation or review of plans, documents, artwork, etc., as well as for archeological monitoring undertaken in fulfillment of the requirements of this mitigation measure, similarly to other consultants and experts employed for subsequent projects under the Waterfront Plan. The ERO, Port/project sponsor and project archeologist, as appropriate, shall work with the tribal representative or other descendant community representatives to identify the appropriate scope of consultation work.

Archeological Data Recovery Program. the project archeologist shall prepare an Archeological Data Recovery Plan (ADRP) if all three of the following apply: (1) a potentially significant resource is discovered, (2) preservation in place is not feasible, and (3) the ERO determines that archeological data recovery is warranted. When the ERO makes such a determination, the project archeologist, project sponsor, ERO and, for tribal cultural archeological resources, the tribal representative, shall coordinate on the scope of the data recovery program, if requested. The archeological consultant shall prepare a draft ADRP and submit it to the ERO for review and approval. If the time needed for preparation and review of a comprehensive ADRP would result in a significant construction delay, the scope of data recovery may instead by agreed upon in consultation between the project archeologist and the ERO and documented by the project archeologist in a memo to the ERO. The ADRP/memo shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain; that is, the ADRP/memo will identify what scientific/historic research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historic property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resource that would not otherwise by disturbed by construction if nondestructive methods are practical.

The ADRP shall include the following elements:

- Field Methods and Procedures: Descriptions of proposed field strategies, procedures, and operations.
- Cataloguing and Laboratory Analysis: Description of selected cataloguing system and proposed types of analyses to be conducted based on anticipated material types.
- Discard and deaccession policy: Description of and rationale for field and post-field discard and deaccession policies.

- Security measures: Recommended security measures to protect the archeological resource from vandalism, looting, and accidental damage.
- Final report: Description of proposed report format and distribution of results.
- Public interpretation: Description of potential types of interpretive products and locations of interpretive exhibits based on consultation with the project sponsor.
- Curation: Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

The project archeologist shall implement the archeological data recovery program upon approval of the ADRP/memo by the ERO.

Coordination of Archeological Data Recovery Investigations. In cases in which the same resource has been or is being affected by another project for which data recovery has been conducted, is in progress, or is planned, the following measures shall be implemented to maximize the scientific and interpretive value of the data recovered from both archeological investigations:

- In cases where neither investigation has not yet begun, both project archeologists and the ERO shall consult on coordinating and collaboration on archeological research design, data recovery methods, analytical methods, reporting, curation and interpretation to ensure consistent data recovery and treatment of the resource.
- In cases where archeological data recovery investigation is already under way or has been completed for a prior project, the project archeologist for the subsequent project shall consult with the prior project archeologist, if available; review prior treatment plans, findings and reporting; and inspect and assess existing archeological collections/inventories from the site prior to preparation of the archeological treatment plan for the subsequent discovery, and shall incorporate prior findings in the final report of the subsequent investigation. The objectives of this coordination and review of prior methods and findings will be to identify refined research questions; avoid redundant work and maximize the benefits of additional data recovery; determine appropriate data recovery methods and analyses; assess new findings relative to prior research findings; and integrate prior findings into subsequent reporting and interpretation.

Treatment of Human Remains and Funerary Objects. The treatment of human remains and funerary objects discovered during any soil-disturbing activity shall comply with applicable State and federal laws. This shall include immediate notification of the Medical Examiner of the City and County of San Francisco. The ERO also shall be notified immediately upon the discovery of human remains. In the event of the Medical Examiner's determination that the human remains are Native American remains, the Medical Examiner shall notify the California State Native American Heritage Commission, which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (Public Resources Code section 5097.98(a)).

The project sponsor and ERO shall make all reasonable efforts to develop a Burial Agreement ("Agreement") with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and associated or unassociated funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). The Agreement shall take into consideration the appropriate

excavation, removal, recordation, scientific analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. If the MLD agrees to scientific analyses of the remains and/or associated or unassociated funerary objects, the archeological consultant shall retain possession of the remains and associated or unassociated funerary objects until completion of any such analyses, after which the remains and associated or unassociated funerary objects shall be reinterred or curated as specified in the Agreement.

If the remains cannot be permanently preserved in place, the Port shall consult with the MLD and may consult with the project archeologist, project sponsor and the ERO on recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop a Burial Agreement (Agreement) with the MLD, as expeditiously as possible, for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5(d)). Per Public Resources Code section 5097.98(c)(1), the Agreement shall address, as applicable and to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinternment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses, after which the remains and funerary objects shall be reinterred or curated as specified in the Agreement.

Both parties are expected to make a concerted and good faith effort to arrive at a Burial Agreement. However, if the Port and the MLD are unable to reach an Agreement on scientific treatment of the remains and/or funerary objects, the ERO, in consultation with the Port shall ensure that the remains and/or funerary objects are stored securely and respectfully until they can be reinterred on the project site, with appropriate dignity, in a location not subject to further or future subsurface disturbance, in accordance with the provisions of state law.

Treatment of historic-period human remains and/or funerary objects discovered during any soil-disturbing activity shall be in accordance with protocols laid out in the project archeological treatment document, and other relevant agreements established between the project sponsor, Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted and the remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan and Land Acknowledgement. If a significant archeological resource is identified, the project archeologist shall prepare a Cultural Resources Public Interpretation Plan (CRPIP). The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program.

If the resource to be interpreted is a tribal cultural resource, the department shall notify Native American tribal representatives that public interpretation is being planned. The CRPIP shall be prepared in consultation with and developed with the participation, if requested by a tribe, of Native American tribal representatives, and the interpretive materials shall include an acknowledgement that the project is located upon traditional Ohlone lands. For interpretation of a tribal cultural resource, the interpretive program may include a combination of artwork, preferably by local Native American artists, educational panels or other informational displays, a plaque, or other interpretative

elements including digital products that address local Native people's experience and the layers of history. As feasible, and where landscaping is proposed, the interpretive effort may include the use and the interpretation of native and traditional plants incorporated into the proposed landscaping.

The project archeological consultant shall submit the CRPIP and drafts of any interpretive materials that are subsequently prepared to the ERO for review and approval. The project sponsor shall ensure that the CRPIP is implemented prior to occupancy of the project.

Archeological Resources Report. Whether or not significant archeological resources are encountered, the archeological consultant shall submit a written report of the findings of the testing program to the ERO. If significant resources were found, the report shall also describe any archeological testing and data recovery efforts and results and provide evaluation of the California Register and tribal significance of any discovered archeological resource. It shall also describe the research design, archeological and historic research methods employed, analytical results and interpretations, and if applicable, curation arrangements. Formal site recordation forms (CA DPR 523 series) shall be attached to the ARR as an appendix.

Once approved by the ERO, the project archeologist shall distribute the approved ARR as follows: copies that meet current information center requirements at the time the report is completed (presently, an electronic copy of the report and of each resources record in pdf format and, if available, GIS shapefiles of the project site and of the boundaries and locations of any recorded resources) to the California Archeological Site Survey Northwest Information Center (NWIC), and a copy of the transmittal of the approved ARR to the NWIC to the ERO; one bound hardcopy of the ARR, along with digital files that include an unlocked, searchable PDF version of the ARR, GIS shapefiles of the site and feature locations, any formal site recordation forms (CA DPR 523 series), and/or documentation for nomination to the National Register of Historic Places/California Register of Historical Resources, via USB or other stable storage device, to the department environmental planning division of the planning department; and, if a descendant group was consulted, a digital or hard copy of the ARR to the descendant group, depending on their preference.

Curation. Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation the Port of project sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

Mitigation Measure M-CR-2d: Treatment of Submerged and Deeply Buried Resources. This measure applies to projects that would include multiple subgrade stories or entail the use of piles, soil improvements or other deep foundations in landfill areas within former creeks, bay marshes or waters of the bay that may be sensitive for submerged or buried historic or Native American archeological resources as determined in the preliminary archeological review prepared by the department; and/or in the event of the discovery of a submerged or deeply buried resource during archeological testing or soil-disturbing construction activities. This measure shall be applied in conjunction with Waterfront Plan Mitigation Measures M-CR-2a, Accidental Discovery, and/or M-CR-2b, Archeological Monitoring Program, and/or M-CR-2c, Archeological Testing Program, and all relevant provisions of those measures shall be implemented in addition to the provisions of this measure, as detailed below.

The following measures additional shall be undertaken upon discovery of a potentially significant deeply buried or submerged resource to minimize significant effects from deep project excavations, soil improvements, pile construction, or construction of other deep foundation systems, in cases where the ERO has determined through consultation with the sponsor, and with tribal representatives as applicable, that preservation in place—the preferred mitigation—is not a feasible or effective option. Note that limiting impacts to a buried or submerged deposit to pile driving or soil improvements shall not be construed as representing preservation in place.

Treatment Determination. If the resource cannot feasibly or adequately be preserved in place, in situ documentation and/or archeological data recovery shall be conducted, consistent with the provisions of Mitigation Measures M-CR-2a, Accidental Discovery; M-CR-2b, Archeological Monitoring Program; and M-CR-2c, Archeological Testing Program, as detailed i the Waterfront Plan EIR MMRP. However, by definition, such resources sometimes are located deeper than the maximum anticipated depth of project mass excavations, such that the resource would not be exposed for investigation, and/or under water or may otherwise pose substantial access, safety or other logistical constraints for data recovery; or the cost of providing archeological access to the resource may demonstrably be prohibitive.

In such cases, where physical documentation and data recovery will be limited by the constraints identified above, the ERO, project sponsor, project archeologist, and tribal representative if requested, shall consult to explore alternative documentation and treatment options to be implemented in concert with any feasible archeological data recovery. The appropriate treatment elements, which would be expected to vary with the type of resource and the circumstances of discovery, shall be identified by the ERO based on the results of consultation from among the measures listed below. Additional treatment options may be developed and agreed upon through consultation if it can be demonstrated that they would be equally or more effective in recovering or amplifying the value of the data recovered from physical investigation of the affected resources by addressing applicable archeological research questions and in disseminating those data and meaningfully interpreting the resource to the public.

Potential treatment measure options listed below are applicable to both Native American archeological deposits and features, and historic maritime resources. Each treatment measure or a combination of these treatment measures, in concert with any feasible standard data recovery methods applied as described above, would be effective in mitigating significant impacts to submerged and buried resources. However, some measures are more applicable to one type of resource than the other; to a specific construction method; to the specific circumstances of discovery; and to the stratigraphic position of the resource. The ERO, in consultation with the project archeologist and project sponsor, shall identify which of these measures that, individually or in combination, will be applicable and effective in recovering sufficient data, enhancing the research value of the data recovery, meaningfully interpreting the resource to the public, or otherwise effectively mitigating the loss of data or associations that will result from project construction. Multiple treatment measures shall be adopted in combination, as needed to adequately mitigate data loss and, as applicable, impacts to tribal cultural values, as determined in consultation with the ERO and, as applicable, tribal representatives.

Additional treatment options may be considered and shall be adopted, subject to ERO approval, if it can be demonstrated that they would provide data relevant to the understanding and interpretation of the resource on the project site or to the affected class of resources (e.g., rare submerged and deeply

buried Native American archeological resources of Early or Middle Holocene age); or that would otherwise enhance the scientific or historic research value of any data recovered directly from the resource; and/or would enhance public interpretation of the resource, as detailed below.

Treatment Program Memo. The project archeologist shall document the results of the treatment program consultation with respect to the agreed upon scope of treatment in a treatment program memo, for ERO review and approval. Upon approval by the ERO, the project sponsor shall ensure that treatment program is implemented prior to and during subsequent construction, as applicable. Reporting, interpretive, curation and review requirements are the same as delineated under the other cultural resources mitigation measures that are applicable to the project, as noted above. The project sponsor shall be responsible for ensuring the implementation of all applicable mitigation measures, as identified in the treatment program memo.

Potential Treatment Measures.

- *Remote Archeological Documentation.* Where a historic feature cannot be recovered or adequately documented in place by the archeologist due to size, bulk or inaccessibility, the archeologist shall conduct all feasible remote documentation methods, such as 3-D photography using a remote access device, remote sensing (e.g., ground-penetrating radar with a low-range [150 or 200 MHz] antenna), or other appropriate technologies and methods, to accurately document the resource and its context. As noted, the project sponsor and contractor shall support remote archeological documentation as needed, such as by assisting with equipment access (e.g., drone, lights and camera or laser scanner mounted on backhoe); providing personnel qualified to enter the excavation to assist with documentation; and accommodating training of construction personnel by the project archeologist so that they can assist in measuring or photographing the resource from inside the excavation in cases when the archeologist cannot be allowed to enter.
- *Modification of Contractor's Excavation Methods.* As needed to prevent damage to the resource before it has been documented; to assist in exposure and facilitate observation and documentation; and potentially to assist in data recovery; at the request of the ERO the project sponsor shall consult with the project archeologist and the ERO to identify modifications to the contractor's excavation and shoring methods. Examples include improved dewatering during excavation; use of a smaller excavator bucket or toothless bucket; discontinuing immediate offhaul of spoils and providing a location where spoils can be spread out and examined by the archeologist prior to being offhauled; and phasing or benching of deep excavations to facilitate observation and/or deeper archeological trenching.
- *Data Recovery through Open Excavation.* If the project will include mass excavation to the depth of the buried/submerged deposit, archeological data recovery shall include manual (preferred) or controlled mechanical sampling of the deposit. If project construction would not include mass excavation to the depth of the deposit but would impact the deposit through deep foundation systems or soil improvements, the ERO and the project sponsor shall consult to consider whether there are feasible means of providing direct archeological access to the deposit (for example, excavation of portion of the site that overlies the deposit to the subject depth so that a sample can be recovered). The feasibility consideration shall include an estimate of the project cost of excavating to the necessary depth and of providing shoring and dewatering sufficient to allow archeological access to the deposit for manual or mechanical recovery.

- *Mechanical Recovery.* If site circumstances limit access to the find in situ, the ERO, archeological consultant and project sponsor shall consider the feasibility of mechanically removing the feature or portion of a feature intact for off-site documentation and analysis, preservation and interpretive use. The consultation above shall include consideration as to whether such recovery is logistically feasible and can be accomplished without major data loss. The specific means and methods and the type and size of the sample shall be identified, and the recovery shall be implemented if determined feasible by the ERO. The sponsor shall assist with mechanical recovery and transport and curation of recovered materials and shall provide for an appropriate and secure off-site location for archeological documentation and storage as needed.

- *Salvage of Historic Materials.* Samples or sections of historic features that cannot be preserved in place (such a structural members of piers or wharves, sections of wooden sea wall, rail alignments, or historic utility or paving features of particular data value or interpretive interest) shall be tested for contamination and, if not contaminated, shall be salvaged for interpretive use or other reuse. These might include uses such as display of a reconstructed resource; use of timbers or planks for furniture, such as landscape boxes, railings, benches or platforms, and signage structures, and installation of such features in publicly accessible open spaces; or other uses of public interest. Historic wood and other salvageable historic structural material not used for interpretation shall be recovered for reuse, consistent with the San Francisco Ordinance No.27-06, which requires recycling or reuse of all construction and demolition debris material removed from a project. If the project has the potential to encounter such features, the project sponsor shall plan in advance for reuse of salvaged historic materials to the greatest extent feasible, including identification of a location for interim storage and identification of potential users and reuses.

- *Data Recovery Using Geoarcheological Cores.* If, subsequent to identification and boundary definition of a buried/ submerged resource, it is deemed infeasible to expose the resource for archeological data recovery, geoarcheological coring of the identified deposit shall be conducted at grid intervals of no greater than 5 meters/15 feet. The maximum feasible core diameter shall be used for data recovery coring. However, while geoarcheological coring can provide basic data about a resource (e.g., food sources exploited, date), due to the of the small size of the sample recoverable through geoarcheological coring the recovered sample, even from numerous cores, this method generally cannot recover a sufficient quantity of data to adequate characterize the range of activities that took place at the site. For this reason, if the coring sample constitutes less than 5 percent of the estimated volume of material within the boundaries of the resource that will be directly impacted by project construction, the following additional measures shall be implemented in concert with geoarcheological coring to fully mitigate significant impacts to such a resource.

- *Scientific Analysis of Data from Comparable Archeological Sites/"Orphaned Collections."* The ERO and the project archeologist shall consult to identify a known archeological site or historic feature, or curated collections or samples recovered during prior investigation of similar sites or features are available for further analysis; and for which site-specific or comparative analyses would be expected to provide data relevant to the interpretation or context reconstruction for the affected site. Appropriate analyses, to be identified in consultation between the ERO, the consultant and (for Native American archeological deposits) the Native American representative(s), may include reanalysis or comparative analysis of artifacts or archival records; faunal or paleobotanical analyses; dating; isotopes studies; or such other relevant studies as may be proposed by members of the project team based on the research design developed for the affected site and on data

available from affected resource and comparative collections. The scope of analyses would be determined by the ERO based on consultation with the project archeologist, the project sponsor, and (for sites of Native American origin) Native American representatives.

- *Additional Off-Site Data Collection and/or Sample and Data Analysis for Historic and Paleoenvironmental Reconstruction.* The ERO and project archeologist shall identify existing geoarcheological data and geotechnical coring records on file with the city of San Francisco; and/or cores extracted and preserved during prior geotechnical or geoarcheological investigations that could contribute to reconstruction of the environmental setting in the vicinity of the identified resource, to enhance the historic and scientific value of recovered data by providing additional data about prehistoric environmental setting and stratigraphic sensitivity; and/or would provide information pertinent to the public interpretation of the significant resource. Objectives of such analyses, depending on the resource type could include: (1) placement of known and as-yet undiscovered Native American archeological resources more securely in their environmental and chronological contexts; (2) more-accurate prediction of locations that are sensitive for Middle Holocene and earlier resources; (3) increased understanding of changes in San Francisco's historic environmental setting (such as the distribution of inland marshes and ponds and forested areas), and of the chronology of both historic period and prehistoric environmental change and human use. Relevant data may also be obtained through geoarcheological coring at accessible sites identified by the ERO through consultation with San Francisco public agencies and private project sponsors.

Mitigation Measure M-TCR-1: Tribal Notification and Consultation.

Summary. Mitigation Measure M-TCR-1, Tribal Notification and Consultation, requires notification of tribal representatives during project-level environmental review of specified types of subsequent projects detailed below. Notification would provide tribal representatives with the opportunity to consult and provide input on whether a tribal cultural resource is present at the subsequent project site, and on whether the subsequent project as proposed would diminish the cultural value of that tribal cultural resource. Consultation under M-TCR-1 would provide opportunities for tribes to review and participate in developing measures to reduce or avoid tribal cultural resource impacts. This measure applies to both archeological tribal cultural resources and non-archeological tribal cultural resources.

Applicability. This measure is applicable for the following types of subsequent projects under the Waterfront Plan:[274]

- Notification for Native American archeological tribal cultural resources:
  - Projects for which the planning department's preliminary archeological review identifies potential impacts to a Native American archeological resource;
  - After the discovery of a significant Native American archeological resource, and when planning for public interpretation of the resource is being initiated.

[274] Note that the tribal notification requirements under Mitigation Measure M-TCR-1 are different than the notification requirements under Public Resources Code section 21080.3.1.

- Notification for non-archeological tribal cultural resources located along the shoreline:
  - Long-term waterfront development projects (50- to 66-year lease terms) along the bay shoreline or piers extending in the bay, including three subsequent projects sites projected for new development: Piers 30–32, Pier 70 Triangle site, and Pier 90;
  - New construction or major redesign of waterfront open spaces (as determined by the ERO) and public access interpretive exhibits and programs located along the shoreline or on piers extending over the Bay, such as interpretive exhibits along The Embarcadero Promenade or the Blue Greenway;
  - Substantial habitat removal or restoration projects (as determined by the ERO), excluding Port maintenance activities or minor improvements; or new construction or major redesign project that would include habitat removal or restoration as a component of the proposed improvements;
  - Projects involving substantial (as determined by the ERO) shoreline stabilization or improvement, including development of natural infrastructure (wetlands, horizontal levees, living shorelines).

Notification. The San Francisco Planning Department shall distribute a notification regarding the subsequent Waterfront Plan projects and programs to the NAHC tribal representative list and others included on the department's Native American tribal distribution, include the Association of the Ramaytush Ohlone and other Ohlone interested parties list. The notification would be conducted during project-level environmental review of the types of subsequent projects specified above. The notification shall include a description of the subsequent project, location, anticipated depth and extent of soil disturbance necessary for construction, and information on changes to public access, removal or addition of native planting or habitat, and any proposed public interpretation as relevant; the conclusions of the preliminary archeological review regarding potential impacts to Native American archeological tribal cultural resources; anticipated next steps, including proposed archeological identification and/or treatment for archeological tribal cultural resources; an invitation to consult on the project; and a timeline for requesting consultation, which is within 30 days after receipt of a notification.

For subsequent projects for which the planning department's preliminary archeological review identifies potential impacts to a Native American archeological tribal cultural resource, the notification will also include the conclusions of the preliminary archeological review regarding potential impacts to Native American archeological resources, and measures proposed to address archeological impacts, as described in Section E.4, Cultural Resources.

Consultation. Tribal representatives who request consultation shall be afforded the opportunity to provide input on potential impacts to tribal cultural resources and measures to mitigate such impacts. The aim of consultation is to ensure that tribal representatives are afforded the opportunity to provide meaningful input into project design, to provide input into the treatment of archeological tribal cultural resources, and to appropriately acknowledge and reflect tribal cultural heritage and values in the design and siting of open space elements, plantings, and interpretive materials.

For subsequent projects affecting Native American archeological resources, the consultation shall afford tribal representatives who respond to the notification the opportunity to provide input on

potential impacts to Native American archeological resources that are tribal cultural resources, and measures to mitigate archeological impacts, including Mitigation Measures M-CR-2a, Procedures for Accidental Discovery of Archeological Resources for Projects Involving Soil Disturbance; M-CR-2b, Archeological Monitoring; M-CR-2c, Archeological Testing; and/or M-CR-2d, Treatment of Submerged and Deeply Buried Resources, as determined applicable by the ERO as described in Section E.4. These measures in regard to archeological tribal cultural resources require that tribal representative be afforded the opportunity to consult on development of archeological investigation plans, to participate in implementation of such plans as they relate to tribal cultural resources, and to recommend that cultural resources awareness training programs for construction workers include Native American tribal representatives and specific training on the treatment of Native American archeological and tribal cultural resources, if requested. These measures also identify preservation in place, if feasible as determined by the ERO, as the preferred treatment of resources that are known or are discovered during archeological investigations or during construction and require that tribal representatives be offered the opportunity to consult on preservation in place determinations and plans, if requested. In addition, these measures require that tribal representatives be offered meaningful opportunities to participate in the development of public interpretive materials that address Native American archeological and tribal cultural resources, and that these materials include acknowledgement that the project is located on traditional Ohlone lands.

For subsequent projects as described above, the consultation shall address potential non-archeological project impacts, with the objective of incorporating feasible site design and other measures into the project consistent with Waterfront Plan policies that, based on consultation, would reduce or eliminate these impacts. Feasible site design and other measures will be included in required BCDC and Waterfront Design Advisory Committee review processes to ensure all public access and design features and improvements are cohesive and consistent with waterfront urban design policies in Port and BCDC plans.

Site-specific measures that may be identified through consultation and are determined feasible by the ERO and the Port would be implemented by the Port or project sponsor in coordination with planning department staff. These could include, but would not be limited to:

- For subsequent projects that require pile-driving or deep foundations that extend to buried soils sensitive for Native American occupation, sampling and paleoenvironmental analysis of soils that would be affected by project piles or excavation to evaluate changes to the Native American environmental setting over the 8,000-year period of their occupation of San Francisco. Data obtained through paleoenvironmental analysis may be included in interpretive exhibits, including native plantings as part of subsequent projects.
- Planting and vegetation treatments in publicly accessible open spaces and community gathering areas that emphasize native and/or environmentally sustainable shoreline plants, such as those traditionally gathered and used by the Ohlone.
- Public interpretive exhibits, coordinated with other Port interpretive programs, subject to public review by BCDC and Waterfront Design Advisory Committee review processes, that educate the public about and/or reflect tribal cultural heritage and values and address local Native American experience and history. Such interpretation program components should be coordinated with other interpretative programs along the waterfront, to maximize and enhance the value of each interpretive effort.

- Public art by local Native American artists.
- Public access areas or ensured access to an on-site space within the subsequent project site (such as a community room) that can be made available for gathering events organized by the local Native American community, by arrangement with event space organizers.
- Other educational tools and applications identified by tribal representatives.

Different or additional project-specific mitigation measures may be identified through Native American consultation if, in consultation between the tribal representative and the ERO, they are determined to be equally as or more effective than the measures identified above in mitigating the specific impact of proposed subsequent projects upon tribal cultural resources.

Project-specific mitigation measures applicable to the subsequent project shall be adopted by mutual agreement between the tribal consultants and the department and shall be implemented by the Port/project sponsor. Measures would be implemented during project design, construction, and operations as relevant to ensure that impacts to the values associated with tribal cultural resources are avoided or minimized, as determined feasible by the ERO.

The consultation process will determine whether subsequent projects would have impacts on the tribal cultural resource and, if so, the extent of impacts and feasible measures to mitigate the impacts. The ERO, Port, and project sponsor shall work with the tribal representatives to develop the scope, timeline, and method of delivery as determined by the ERO. Tribal representatives who engage in preparation or review of plans and documents shall be compensated for their work to fulfill their role in carrying out the mitigation requirements as determined through the scoping process described above.

If no tribal group requests consultation, but the ERO nonetheless determines that the proposed project may have a potential significant adverse effect on a tribal cultural resource based on prior consultation, the ERO may require implementation of the site-specific measures and treatments listed above, as applicable.

Mitigation Measure M-WI-1a: Wind Analysis and Minimization Measures for Subsequent Projects. All projects proposed within the Plan Area that would have a height greater than 85 feet shall be evaluated by a qualified wind expert, in consultation with the San Francisco Planning Department, to determine their potential to result in a new wind hazard exceedance or aggravate an existing wind hazard exceedance (defined as the one-hour wind hazard criterion with a 26 mph equivalent wind speed). If the qualified expert determines that wind-tunnel testing is required due to the potential for a new or worsened wind hazard exceedance, such testing shall be undertaken in coordination with San Francisco Planning Department staff, with results summarized in a wind tunnel report. The buildings tested in the wind tunnel shall incorporate only those wind baffling features that can be shown on plans. Such features must be tested in the wind tunnel and discussed in the wind tunnel report in the order of

preference discussed below, with the overall intent being to reduce ground-level wind speeds in areas of substantial use by people walking (e.g., sidewalks, plazas, building entries, etc.):

1. *Building Massing.* New buildings and additions to existing buildings shall be shaped to minimize ground-level wind speeds. Examples of these include setbacks and/or podiums, stepped and/or curved facades, and vertical steps in the massing to help disrupt downwashing flows.
2. *Wind Baffling Measures on the Building and on the Project Sponsor's Private Property.* Wind baffling measures shall be included on future buildings and/or on the parcel(s) to disrupt vertical wind flows along tower façades and through the project site. Examples of these may include staggered balcony arrangements on main tower façades, screens, canopies, and/or fins attached to the buildings, covered walkways, colonnades, large-scale art features, landscaping, free standing canopies, and/or wind screens. Solid windscreens have a greater effect at reducing the wind speeds to immediate leeward side of the screens; however, outside of this area of influence, the winds are either unaffected or accelerated. Porous windscreens have less of an impact to the immediate leeward side; however, they have an increased area of influence and are less likely to cause any accelerations of the winds further downwind.

Only after documenting all feasible attempts to reduce wind impacts via building massing and wind baffling measures on a building, shall the following be considered:

3. *Landscaping and/or Wind Baffling Measures in the Public Right-of-Way.* Landscaping and/or wind baffling measures shall be installed to slow winds along sidewalks and protect places where people walking are expected to gather or linger. Landscaping and/or wind baffling measures shall be installed on the windward side of the areas of concern (i.e., the direction from which the wind is blowing). Landscaping typically affects winds locally; the larger the tree crown and canopy, the greater the area of influence. Tall, slender trees with little foliage have little to no impact on local winds speeds at ground level because of the height of the foliage above ground. Shorter street trees with larger canopies help reduce winds around them but their influence on conditions farther away is limited. Examples of wind baffling measures may include street art to provide a sheltered area for people to walk and free-standing canopies and wind screens in areas where people walking are expected to gather or linger. If landscaping or wind baffling measures are required as one of the features to mitigate wind impacts, Mitigation Measure M-WS-1b (below) shall also apply:

Mitigation Measure M-WI-1b: Maintenance Plan for Landscaping and Wind Baffling Measures in the Public Right-of-Way. If it is determined that a subsequent project could not reduce additional wind hazards via massing or wind baffling measures on the subject building or the developer's property and therefore landscaping and/or wind baffling features are to be installed in the public right-of-way, the project sponsor for the subsequent project shall prepare a maintenance plan for review and approval by the San Francisco Planning Department to ensure maintenance of the features in perpetuity.

Mitigation Measure M-GE-6a: Unanticipated Discovery of Paleontological Resources during Construction. The following procedures must be undertaken for project construction activities:

- *Worker Awareness Training.* Prior to commencing construction, and ongoing throughout ground disturbing activities (e.g., excavation, utility installation), the project sponsor and/or their designee shall ensure that all project construction workers are trained on the contents of the Paleontological Resources Alert Sheet, as provided by the planning department. The Paleontological Resources Alert Sheet shall be prominently displayed at the construction site during ground disturbing activities for reference regarding potential paleontological resources.

  In addition, the project sponsor shall inform the contractor and construction personnel of the immediate stop work procedures and other procedures to be followed if bones or other potential fossils are unearthed at the project site. Should new workers that will be involved in ground disturbing construction activities begin employment after the initial training has occurred, the construction supervisor shall ensure that they receive the worker awareness training as described above.

  The project sponsor shall complete the standard form/affidavit confirming the timing of the worker awareness training to the Environmental Review Officer (ERO). The affidavit shall confirm the project's location, the date of training, the location of the informational handout display, and the number of participants. The affidavit shall be transmitted to the ERO within 5 business days of conducting the training.

- *Paleontological Resource Discoveries.* In the event of the discovery of an unanticipated paleontological resource during project construction, ground disturbing activities shall temporarily be halted within 25 feet of the find until the discovery is examined by a qualified paleontologist as recommended by the Society of Vertebrate Paleontology standards (SVP 2010) and Best Practices in Mitigation Paleontology (Murphey et al. 2019). Work within the sensitive area shall resume only when deemed appropriate by the qualified paleontologist in consultation with the ERO.

The qualified paleontologist shall determine: (1) if the discovery is scientifically significant; (2) the necessity for involving other responsible or resource agencies and stakeholders, if required or determined applicable; and (3) methods for resource recovery. If a paleontological resource assessment results in a determination that the resource is not scientifically important, this conclusion shall be documented in a Paleontological Evaluation Letter to demonstrate compliance with applicable statutory requirements (e.g., Federal Antiquities Act of 1906, CEQA Guidelines section 15064.5, California Public Resources Code chapter 17, section 5097.5, Paleontological Resources Preservation Act 2009). The Paleontological Evaluation Letter shall be submitted to the ERO for review within 30 days of the discovery.

If the qualified paleontologist determines that a paleontological resource is of scientific importance, and there are no feasible measures to avoid disturbing this paleontological resource, the qualified paleontologist shall prepare a Paleontological Mitigation Program. The mitigation program shall include measures to fully document and recover the resource of scientific importance. The qualified paleontologist shall submit the mitigation program to the ERO for review and approval within 10 business days of the discovery. Upon approval by the ERO, ground disturbing activities in the project area shall resume and be monitored as determined by the qualified paleontologist for the duration of such activities.

The mitigation program shall include: (1) procedures for construction monitoring at the project site; (2) fossil preparation and identification procedures; (3) curation of paleontological resources of scientific importance into an appropriate repository; and (4) preparation of a Paleontological Resources Report (report or paleontology report) at the conclusion of ground disturbing activities. The report shall include dates of field work, results of monitoring, fossil identifications to the lowest possible taxonomic level, analysis of the fossil collection, a discussion of the scientific significance of the fossil collection, conclusions, locality forms, an itemized list of specimens, and a repository receipt from the curation facility. The project sponsor shall be responsible for the preparation and implementation of the mitigation program, in addition to any costs necessary to prepare and identify collected fossils, and for any curation fees charged by the paleontological repository. The paleontology report shall be submitted to the ERO for review within 30 business days from conclusion of ground disturbing activities, or as negotiated following consultation with the ERO.

Mitigation Measure M-GE-6b: Paleontological Resource Monitoring Plan during Construction. During the course of implementing Mitigation Measure M-GE-6a, if a significant paleontological resource is encountered, the project sponsor shall engage a qualified paleontologist to develop a site-specific monitoring plan prior to commencing soil-disturbing activities at the project site. The Paleontological Monitoring Plan would determine project construction activities requiring paleontological monitoring based on those likely to affect sediments with moderate sensitivity for paleontological resources. Prior to issuance of any demolition permit, the project sponsor shall submit the Paleontological Resource Monitoring Plan to the ERO for approval.

At a minimum, the plan shall include:

1. Project Description
2. Regulatory Environment – outline applicable federal, state, and local regulations
3. Summary of Sensitivity Classification(s)
4. Research Methods, including but not limited to:
    - 4a. Field studies conducted by the approved paleontologist to check for fossils at the surface and assess the exposed sediments.
    - 4b. Literature Review to include an examination of geologic maps and a review of relevant geological and paleontological literature to determine the nature of geologic units in the project area.
    - 4c. Locality Search to include outreach to the University of California Museum of Paleontology in Berkeley.
5. Results: to include a summary of literature review and finding of potential site sensitivity for paleontological resources; and depth of potential resources if known.
6. Recommendations for any additional measures that could be necessary to avoid or reduce any adverse impacts to recorded and/or inadvertently discovered paleontological resources of scientific importance. Such measures could include:
    - 6a. Avoidance: If a known fossil locality appears to contain critical scientific information that should be left undisturbed for subsequent scientific evaluation.

6b. Fossil Recovery: If isolated small, medium- or large-sized fossils are discovered during field surveys or construction monitoring, and they are determined to be scientifically significant, they should be recovered. Fossil recovery may involve collecting a fully exposed fossil from the ground surface, or may involve a systematic excavation, depending upon the size and complexity of the fossil discovery.

6c. Monitoring: Monitoring involves systematic inspections of graded cut slopes, trench sidewalls, spoils piles, and other types of construction excavations for the presence of fossils, and the fossil recovery and documentation of these fossils before they are destroyed by further ground disturbing actions. Standard monitoring is typically used in the most paleontologically sensitive geographic areas/geologic units (moderate, high and very high potential); while spot-check monitoring is typically used in geographic areas/geologic units of moderate or unknown paleontological sensitivity (moderate or unknown potential).

6d. Data recovery and reporting: Fossil and associated data discovered during soils disturbing activities should be treated according to professional paleontological standards and documented in a data recovery report. The plan should define the scope of the data recovery report.

The consultant shall document the monitoring conducted according to the monitoring plan and any data recovery completed for significant paleontological resource finds discovered, if any. Plans and reports prepared by the consultant shall be considered draft reports subject to revision until final approval by the ERO. The final monitoring report and any data recovery report shall be submitted to the ERO prior to the certificate of occupancy.

Mitigation Measure M-HY-1: Water Quality Best Management Practices for In-Water Work. The project sponsor shall implement water quality best management practices to protect water quality from pollution due to fuels, oils, lubricants, and other harmful materials, as determined in consultation with the Environmental Planning Division of the San Francisco Planning Department based on review of engineering and construction details of project improvements. The Planning Department shall review best management practices detailed in the San Francisco Department of Public Health Pollution Prevention Toolkit for Maritime Industries along with other measures as may be identified to address specific construction details of proposed project improvement to determine the specific mitigation details, which may include:

- Preparation of a spill prevention control and countermeasure (SPCC) plan to address the emergency cleanup of any hazardous material and will be available on site, which typically includes:
  - Methods to address the emergency cleanup of any hazardous material and what materials will be available on site;
  - SPCC, hazardous waste, stormwater and other emergency planning requirements;
  - Measures to prevent spills into the Bay associated with in water fueling, if in water fueling is required on some of the construction barges. Such measures can include:
    - Secondary booms and/or pads, depending upon where fueling would take place on the vessel;

- Secondary containment on the deck of the vessel to contain the petroleum product;
- Specifying volume of petroleum products that will be on the vessel and evaluating the potential for spills. Absorbent and cleanup materials (such as oil sorbent boom, heavy oil pads, Oil-Dri Absorbent Floor, etc.) of sufficient quantity to clean up potential spill volume shall be provided; and
- The locations of properly permitted offsite locations where vessels will be fueled.

- Fueling of equipment consistent with proper fuel transfer procedures as per U.S. Coast Guard regulations (33 CFR 156.120 and 33 CFR 155.320), including inspection requirements of spill containment and the fueling location to document that no spills have occurred, or that any spills are cleaned up immediately.
- Well-maintained equipment is used to perform the construction work, and equipment maintenance is performed off site when possible. Daily equipment inspections to help prevent leaks or spills. Leaks or spills are best cleaned up when discovered, with proper disposal of cleaning materials;
- Precautions to protect listed species, their habitats, and Essential Fish Habitat from construction by-products and pollutants such as demolition debris, construction chemicals, fresh cement, saw-water, or other deleterious materials. Construction will be conducted from both land and water, and care shall be used by equipment operators to control debris so that it does not enter the Bay.
- A materials management disposal plan (MMDP) to prevent any debris from falling into the Bay during construction to the maximum extent practicable. The measures identified in the MMDP are commonly based on the Best Available Technology, and may include:
  - During construction, any barges performing the work shall be moored in a position to capture and contain the debris generated during any sub-structure or in-water work. In the event that debris does reach the Bay, personnel in workboats within the work area shall immediately retrieve the debris for proper handling and disposal. All debris shall be disposed of at an authorized upland disposal site;
  - Measures to ensure that fresh cement or concrete shall not be allowed to enter San Francisco Bay. Construction waste shall be collected and transported to an authorized upland disposal area, and per federal, state, and local laws and regulations;
  - All hazardous material shall be stored upland in storage trailers and/or shipping containers designed to provide adequate containment. Short-term laydown of hazardous materials for immediate use shall be permitted with the same anti-spill precautions;
  - All construction material, wastes, debris, sediment, rubbish, trash, fencing, etc., shall be removed from the site once the proposed project is completed and transported to an authorized disposal area, in compliance with applicable federal, state, and local laws and regulations;
  - Construction material shall be covered every night and during any rainfall event (if there is one);
  - Construction crews shall reduce the amount of disturbance within the project site to the minimum necessary to accomplish the project; and
  - Measures to prevent saw water from entering the Bay.

G. Public Notice and Comment

The planning department prepared and distributed a notice of availability of a notice of preparation of an EIR on August 26, 2020. The notices were mailed to a variety of City departments and neighborhood groups, other public agencies, and interested parties. A virtual public scoping meeting was held on September 9, 2020, at which oral comments from the public were received and transcribed. At the public scoping meeting, two people commented. Written comments regarding the scope of the EIR were accepted for a standard 30-day period, from September 9, 2020, until September 25, 2020.

Table 5 lists the comments on topics raised during the public scoping period and, therefore, are addressed in this initial study or in the Draft EIR.

Table 5 Summary of Scoping Comments

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
AGENCIES		
San Francisco Public Utilities Commission (Craig Freeman, Utility Planning Division, and Anne Roche, Project Management)	• Describe the relationship, if any, between the Waterfront Plan's development concepts and actions planned under the Embarcadero Seawall Program.	• **Chapter 4** Environmental Setting, Impacts, and Mitigation Measures
	• Include an advisory analysis or disclosure on the effects of sea-level rise on developments contemplated in the Waterfront Plan, including impacts related to sea-level rise-induced raising of groundwater levels, including impacts on below-grade structures (e.g., basements), and note any performance criteria for new sewers in new developments.	• **Appendix B, Section E.17** Hydrology and Water Quality • **Appendix B, Section E.13** Utilities and Service Systems
	• Address flooding impacts including changes in precipitation and groundwater levels due to climate change.	• **Appendix B, Section E.17** Hydrology and Water Quality
Native American Heritage Commission (*Nancy Gonzalez-Lopez, Cultural Resources Analyst)*	• AB 52 and SB 18 tribal consultation procedures. Comment provided mitigation measures to avoid or minimize significant adverse impacts to tribal cultural resources, if feasible.	• **Section 4.B** Cultural Resources
San Francisco Bay Conservation and Development Commission (BCDC; Shannon Fiala, Planning Manager)	• Acknowledge and describe BCDC's jurisdiction and permit authority over the project site. • Describe the consistency of the proposed project with the McAteer-Petris Act, the Bay Plan, BCDC's Seaport Plan, and the San Francisco Bay Plan Map policies and suggestions. • Describe the consistency of the proposed project with the San Francisco Waterfront Special Area Plan, including a description of the public benefits that would be provided by the proposed project.	• **Chapter 3** Plans and Policies • **Appendix B, Section E.17** Hydrology and Water Quality

Table 5 Summary of Scoping Comments

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• Analyze the consistency of the proposed project with Bay Plan policies including: – Bay Plan Shoreline Protection policies – Bay Plan Dredging policies (if applicable) – Relevant Bay Plan Water-Related Industry policies – Bay Plan Port policies – Bay Plan Commercial Fishing policies – BCDC's law and Bay Plan policies regarding fill – Bay Plan Public Trust policies • Analyze consistency of the proposed project with Bay Plan Policies pertaining to Water Quality. • Address the consistency of the project with Bay Plan Climate Change and Safety of Fills policies and include a discussion of how the proposed project will encourage development on the waterfront that is designed to adapt to, tolerate, and/or manage sea-level rise and shoreline flooding and to ensure resilience to mid-century sea-level rise projections, and adaptation to end of the century projections. • Sea-level rise analysis should include the mean higher high water level, the 100-year flood elevation, the mid- and end-of-century sea-level projections, preferably using projections based on the best-available science found in the state's sea-level rise guidance, anticipated site-specific storm surge effects, and a preliminary assessment of the project's vulnerability to future flooding and sea-level rise.	•
	• Analyze the consistency of the proposed project with San Francisco Bay Plan (Bay Plan) policies on Appearance, Design, and Scenic Views.	• **Section 4.A** Aesthetics
	• Analyze the consistency of the proposed project with Bay Plan Transportation Policies.	• **Section 4.C** Transportation and Circulation
	• Examine the potential for the proposed project to negatively affect community health, including any contributions to cumulative effects.	• **Section 4.E** Air Quality
	• Analyze the consistency of the proposed project with Bay Plan Policies pertaining to Fish, Other Aquatic Organisms, and Wildlife; Tidal Marshes and Tidal Flats; and Subtidal Areas. • Describe whether any proposed adaptation strategies would have the potential to adversely affect wildlife habitat.	• **Section 4.F** Biological Resources

Table 5 Summary of Scoping Comments

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	• Address the culturally relevant community outreach and engagement efforts that have been conducted for the proposed project, identify whether the Waterfront Plan area includes vulnerable communities, and if so, identify any potential disproportionate impacts that could result from the proposed project.	• **Chapter 5** Other CEQA Considerations
	• Analyze the consistency of the proposed project with Bay Plan policies regarding Public Access and Recreation. • Describe whether any proposed adaptation strategies would have the potential to adversely affect public access areas.	• **Chapter 3** Plans and Policies • **Appendix B, Section E.12** Recreation
	• Discuss the effects, if any, that the Waterfront Plan would have on existing public access or other conditions required in existing BCDC permits within the project area.	• **Chapter 2** Project Description
California Department of Toxic Substances Control (Sagar Bhatt, Project Manager Site Mitigation and Restoration Program)	• Address the existence of land use covenants in the Mission Rock Neighborhood and previous hazardous waste and/or hazardous materials that existed in those locations or incorporate the information by reference to the Mission Rock EIR and other appropriate documents.	• **Appendix B, Section E.18** Hazards and Hazardous Materials
California Department of Fish and Wildlife (Gregg Erickson, Regional Manager Bay Delta Region)	• Address proposed increases in artificial lighting which may have the potential to significantly and adversely affect biological resources. • Address impacts related to glass used for exterior building windows and bird collisions, which can cause bird injury and mortality. • Evaluate potential impacts to nesting bird species. • Recommend mitigation measures to address potentially significant, direct and indirect impacts on biological resources pertaining to nesting bird surveys and nesting bird buffers. • Recommend limiting impacts on sensitive species during in-water construction. • Analyze potential impacts of the proposed project on eelgrass habitat including potential shading impacts from over-water structures. • Address potential underwater noise and vibration impacts from pile driving, pile repair, and pile replacement.	• **Section 4.F** Biological Resources

Table 5 Summary of Scoping Comments

Commenter	Summary of Comment	Draft EIR and/or Initial Study Section
	INDIVIDUALS	
David Pilpel	• Provide videoconference public comment opportunities that do not require an email address. • Clarify where and how to access proposed project-related documents and materials. • Add CEQA review process and public meetings related to the proposed project to the Port's website.	• **Chapter 1** Introduction
	• The project description should be clear, complete, finite, and stable.	• **Chapter 2** Project Description
	• Address cumulative impacts of the proposed project and consider related projects. • Cumulative projects should include all related projects, private and public, whether exempt or not exempt from CEQA, and whether approved or not yet approved, but planned within the EIR timeframe.	• **Chapter 4** Environmental Setting, Impacts, and Mitigation Measures
	• Address the impacts of the proposed project on historical features of existing Port facilities.	• **Appendix B, Section 4.B** Cultural Resources
	• Address impacts related to the Port and transportation including ferry transit, passenger cruise, rail freight, and truck access.	• **Section 4.C,** Transportation and Circulation
	• Address impacts related to sea-level rise using a range of reasonable scenarios.	• **Appendix B, Section E.17** Hydrology and Water Quality
Howard Wong	• Address opportunities for increased open-air transit including ferries and water taxi.	• **Section 4.C** Transportation and Circulation

H. Determination

On the basis of this Initial Study:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.

Lisa Gibson
Environmental Review Officer
for
Rich Hillis
Director of Planning

DATE February 23, 2022

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APPENDIX C

Growth Projections Memorandum

WATERFRONT PLAN
LAND USE ASSUMPTIONS AND GROWTH PROJECTIONS MEMORANDUM

This report describes the land use assumptions and growth projections used to develop the environmental analyses in the Waterfront Plan Update EIR. Since the Waterfront Plan is a policy document, the approval of goals and policies to update the Waterfront Plan would not directly result in physical changes to the environment. The updated Waterfront Plan defines desired improvements and acceptable uses for Port property, and provides guidance for future subsequent projects. The Waterfront Plan EIR is a program EIR pursuant to CEQA Guidelines section 15168, in which the environmental analysis assumes implementation of future subsequent projects under the Waterfront Plan that physically change the waterfront. Subsequent projects will include new development and historic rehabilitation projects, property leases, waterfront open space, or other site improvements.

To support the programmatic analysis in the EIR, the San Francisco Planning Department, in collaboration with Port planning staff, developed land use assumptions and growth projections for Port-owned properties. The Port land use assumptions were coordinated with City land use projections produced by the Planning Department to support analyses of impacts related to the Waterfront Plan, and cumulative impacts. The EIR establishes 2020 as the existing conditions, and 2050 as the timeframe for when the land use assumptions and growth projections are assumed to be implemented. To establish the 2020 existing conditions for the Waterfront Plan, the Planning Department relied on Port of San Francisco real estate lease data to describe existing uses and square footages for all Port properties in each of the five Waterfront Plan subareas.

The 2050 land use assumptions for Port properties include maritime, non-maritime, commercial, public and recreational uses in existing facilities, as well as in new development that could occur on existing parking lots and vacant sites. The Planning Department evaluated the Port land use assumptions with regard to regional land use forecasts and determined they were reasonable to incorporate into 2050 citywide forecasts of new jobs and housing units. This approach allows the Waterfront Plan EIR to analyze unique types of uses along the waterfront, such as cargo and cruise terminals, as well as other maritime uses.

The land use assumptions and growth projections for Port properties reflect a number of subsequent projects and a variety of open space projects and waterfront improvements that could occur with implementation of the Plan, resulting in a reasonable worse case analysis of environmental effects. There are multiple dynamic variables that determine the number and type of subsequent projects that could occur under the Waterfront Plan. The land use assumptions reflect an alignment of strong real estate market and financing conditions, development and community partnerships, robust public engagement, and interagency coordination between the City, the San Francisco Bay Conservation and Development Commission (BCDC), the California State Lands Commission, and other regulatory agencies. The land use assumptions include environmental sustainability considerations proposed in the Waterfront Plan policies. For example, the Waterfront Plan promotes efforts to identify a location to support a second facility at Pier 50 for passenger cruise ship berthing that can be improved with shoreside power to meet new air quality standards.

SUBSEQUENT PROJECTS

As a program EIR, the analysis of environmental effects of the land uses and growth that could occur under the Waterfront Plan provides a long-term, programmatic assessment of future environmental conditions and mitigation measures to reduce or eliminate significant impacts. Future proposals for actual projects, referred to as "subsequent projects" in the Waterfront Plan EIR, would require project-specific environmental review by the planning department. Upon submission of a project application for a subsequent project, the Waterfront Plan EIR would be reviewed as part of that project-specific environmental review process to include relevant analyses and conclusions from the EIR, and determination by the planning department of any additional project-specific analysis necessary in order for subsequent projects to satisfy the requirements of CEQA.

SUMMARY OF LAND USE ASSUMPTIONS AND GROWTH PROJECTIONS

Below is a summary of the land use assumptions and growth projections underlying the analysis of environmental impacts in the EIR. These land use assumptions would be consistent with the Waterfront Plan amendments, and existing zoning and building height classifications under the San Francisco Planning Code and Zoning Map. The land use assumptions were prepared prior to the Port Commission's selection of developers from a Request for Proposal (RFP) public process for Piers 38–40 and Piers 30–32 and Seawall Lot 330. The Waterfront Plan assumptions do not match the land use programs identified in the Piers 30–32 and Piers 38–40 RFP proposals. Instead, the land use assumptions and growth projections for these sites are based on development that would comply with the existing zoning and bulk and height restrictions. Any future project proposed on these sites, or any other subsequent project proposed in the Waterfront Plan area, that would not comply with the existing zoning and bulk and height restrictions would be required to undergo its own environmental review.

2020 EXISTING CONDITIONS

- Port real estate and maritime leases and property agreements (including land use square footages) in effect in 2020. The leases and property agreements are for maritime, commercial, industrial, institutional, public access, and recreational uses along the 7.5-mile waterfront owned and managed by the Port of San Francisco.
- Projects that were under construction in 2020: 88 Broadway affordable housing project (in partnership with Bridge Housing); SF Downtown Ferry Terminal Phase 2 (in partnership with WETA); Pier 70 20th Street Historic Core Rehabilitation (in partnership with Orton Development Inc.); Pier 22½ Fireboat Station (in partnership with the San Francisco Fire Department and San Francisco Public Works); Alcatraz Landing at Pier 31 (in partnership with U.S. National Park Service and Golden Gate Parks Conservancy)

2050 LAND USE ASSUMPTIONS AND GROWTH PROJECTIONS

- Ongoing leases of Port-owned piers, structures, and undeveloped parcels that continue the mix of maritime, non-maritime, public access activities characteristic of 2020 existing conditions, except for properties assumed to be improved for long-term development leases or public improvement. These assumptions include new leases for maritime excursion and vessel operators that include pier apron and interior pier space for maritime berthing and work areas; and new water taxi stop locations at Pier 70, Pier 48½, or Pier 50, and along Islais Creek.
- **Long-term historic rehabilitation development in the Embarcadero Historic District:** Piers 26, 28, 38, 40, 19–23, 29, 31–33, and 45, Shed A bulkhead and shed structures, consistent with the Waterfront Plan

Diverse Use Policies 27a–f. Historic rehabilitation of Pier 17 assumed pursuant to current lease and agreements with the Exploratorium Museum. Historic rehabilitation of the Agriculture Building with retail uses that replace and reduce the amount of existing office space in the building. All Embarcadero Historic District property improvements must be consistent with the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties.

- **Pier 70 shipyard:** Assumes maritime industrial uses of the Pier 70 shipyard that are not restricted to ship repair activities.
- **Pier 50 back-up cruise ship terminal:** Assumes pier apron repairs and fendering, installation of shore-power utility to power cruise ships to reduce greenhouse gas emissions and meet air quality standards. Assumptions also include conversion of existing pier shed(s) for passenger staging and cruise support. Pier 50 would replace and shut down the Pier 35 secondary cruise terminal to preserve existing cruise call capacity; no intensification of cruise operations would occur.
- **New construction and long-term development of Port parking lots:** Existing parking lots on Port Seawall Lots (SWLs) 314, 321, 330; Piers 30–32; and Pier 70 Triangle site are assumed to be converted to new developments consistent with the Waterfront Plan, and existing zoning and height and bulk limits. The height limit for SWL 330 is 105 feet, and 40 feet for SWL 314, SWL 321, and Piers 30–32. SWL 314 is assumed to be four stories with retail on the ground floor and structure parking on three floors above. SWL 321 is assumed to be an office building with ground-floor retail and parking, and office above on three floors. SWL 330 is assumed to be a 10-story building with hotel and residential uses and ground-floor retail use. Piers 30–32 is assumed to be developed on two-thirds of the pier with retail and public-oriented uses on the ground floor, office and public-oriented uses on three floors above, and public access on one-third of the pier including pier apron improvement for deepwater maritime vessel berthing. The assumptions include preserving the existing Red's Java House restaurant. The Pier 70 Triangle site parking lot is located between the eastern end of the Pier 70 shipyard and Building 6, and is assumed to be developed with a cultural use.
- **Ferry Building Plaza:** Assumes public improvements on the bayside of the Ferry Building, integrated with the Golden Gate Ferry Terminal to the north, the BART structure and restaurant use to the east, and the Downtown Ferry Terminal to the south to create an improved civic plaza with utilities, lighting, and amenities to support the existing farmer's market and other public events and gatherings. The improvements are coordinated with the Ferry Building master tenant, and may include renovation of the restaurant building on the east, and design and public benefit requirements developed with the City, BCDC, and the California State Lands Commission.
- **Piers 94–96 Backlands warehouse development:** Assumes new warehouse development on Pier 96, and Pier 94 Backlands to support cargo and maritime industrial operations and maintain strong industrial base in San Francisco, consistent with the Waterfront Plan maritime policies 14–18. The Pier 94 Backlands warehouses include demolition of the red-tagged Pier 90 grain silos.

OTHER PORT GROWTH

- The land use assumptions and growth projections also include implementation of projects on Port properties that have secured all approvals but had not started construction by 2020: the TZK Broadway and Teatro ZinZanni at SWLs 323 and 324; the Mission Rock Special Use District and Mission Bay Ferry Terminal project in the Mission Bay waterfront; the Pier 70 Special Use District development by Brookfield Inc.; and the Pier 70 Parcel K North by PKN Manager LLC. These projects were analyzed in separate CEQA documents and have secured all City approvals.

Table 1 presents the housing unit, population, and employment information for the Waterfront Plan area in 2020. The 2020 existing conditions for the Waterfront Plan area includes 410 housing units, 850 residents, and 12,910 jobs (column A in the table). Growth attributable to only the Waterfront Plan amounts to approximately 260 additional housing units, approximately 540 additional residents, and approximately 14,800 additional jobs (column B in the table). Therefore, the existing conditions plus growth projections assumed under the Waterfront Plan in 2020 would total 670 housing units, 1,380 residents, and 27,700 jobs. Some population and employment growth would be expected to occur in the Plan area without implementation of the Waterfront Plan, which is shown in column C of the table as 2020 to 2050 Growth Without Plan. The total growth assumed to occur on Port-owned properties by 2050, which includes existing conditions, growth attributable to the Waterfront Plan, and growth that would be expected to occur in the Plan area without the Waterfront Plan, would total 6,940 housing units, 14,440 residents, and 43,200 jobs (column (d) in the table).

Table 1 Summary of Growth Projections

	(a) 2020 Existing Conditions[a]	(b) Waterfront Plan Growth[b]	2020 Existing Conditions plus Waterfront Plan Growth (a + b)	(c) 2020 to 2050 Growth Without Waterfront Plan[c]	2050 Condition Without Waterfront Plan (a + c)	(d) 2050 Condition with Waterfront Plan (a + b + c)
Housing Units	410	260	670	6,280	6,690	6,940
Population[d]	850	540	1,380	13,060	13,910	14,440
Employment (Jobs)	12,910	14,800	27,700	15,490	28,400	43,200

SOURCES: San Francisco Planning Department and Port of San Francisco, 2020

NOTES:

[a] Existing conditions includes individual projects that were entitled and under construction as of March 31, 2020.
[b] The Waterfront Plan Growth conditions includes a maximum development program for the subsequent project sites. The maximum development program for the sites assumes no changes to the underlying zoning and height and bulk districts.
[c] The 2020 to 2050 Growth Without Project conditions includes larger, long-term development projects within the Waterfront Plan area (Mission Rock and Pier 70 SUDs), which have completed CEQA documentation and have been approved.
[d] Assumes 2.08 persons per household based on an average of the persons per household for the census tracts located within Port-owned property (Census tracts 101, 105, 226, 231.03, 607, 615, and 9809), Selected Housing Characteristics, ACS 2015–2019, 5-Year, Table DP04, California & San Francisco.

ASSUMPTIONS FOR WATERFRONT PLAN EIR ALTERNATIVE B, LOWER-GROWTH ALTERNATIVE

Alternative B, the Lower-Growth Alternative, assumes the Waterfront Plan would result in a lower amount of infill development on Port properties than that assumed for the Waterfront Plan analyzed in the EIR, as described above. Under Alternative B, it is assumed that the Waterfront Plan would exclude certain policies related to increasing the feasibility of Embarcadero Historic District pier repair and rehabilitation projects (Waterfront Plan Diverse Use Policies 24, 25, 27, and 29). Alternative B also assumes that Waterfront Plan Diverse Use Policy 36 is excluded from the Waterfront Plan, which would result in a lower amount of development on seawall lots within the Plan area. Together, this would constrain the number of subsequent projects that could occur under the updated Waterfront Plan. For instance, fewer Embarcadero Historic District piers would be rehabilitated and seismically improved to allow public uses of facilities. Some unimproved piers would be leased for lower occupancy industrial shed uses, and some piers are assumed to deteriorate to a point where they are vacated due to poor structural integrity and are closed pursuant to Port Building Code

requirements. As compared to the Waterfront Plan, Alternative B assumes lower growth projections based on the following:

- **Less Embarcadero Historic District pier rehabilitation:** Piers 26 and 28 are not assumed to be seismically upgraded or rehabilitated to allow the piers to be opened to public-oriented uses; the growth assumptions for this alternative continue low-intensity industrial, maritime, and small amounts of commercial uses in these piers. Embarcadero Historic District Piers 45, Shed A; 40; 19–23; 29; and 31 are assumed to be historic rehabilitation development projects consistent with the proposed Waterfront Plan Diverse Use Policies 24, 25, 27, and 29, with a higher ratio of public-oriented uses in the pier sheds than assumed in for the Waterfront Plan.
- **Piers that are closed due to poor structural condition:** Piers 30–32, 33, 35, 38, and 54 are assumed to no longer be leasable for low-intensity uses and closed because they do not meet Port Building Code standards for continuation of these uses. However, use of the Red's Java House structure is assumed to continue to be maintained and operated on Piers 30–32.
- **Fewer seawall lot developments:** SWLs 314 and 321 are assumed to remain as parking lots and not be redeveloped. SWL 330 is assumed to be developed as a residential project.

The lower growth projections for Alternative B include the addition by 2050 of approximately 260 housing units and 540 residents (like the Waterfront Plan), and approximately 2,060 jobs (about 14 percent less than the Waterfront Plan).

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APPENDIX D

Waterfront Plan Historic Resources Inventory and Summary Report

1. Introduction

This Port of San Francisco (Port) Historic Resources Summary Report provides an update to the *Port of San Francisco Historic Resources Data Base* completed by Architectural Resources Group (ARG) in November 1996. This effort has been undertaken by architecture + history, llc (a + h) as an analysis for the Draft Environmental Impact Report for the Waterfront Plan published in December 2019. This summary report identifies historic resources within and adjacent to the Waterfront Plan area. This effort was completed by Bridget Maley, principal architectural historian at a + h, who was also a member of the 1996 ARG project team.

This summary report is based on data compiled for the 1996 database (provided as an Appendix of this report). The 1996 database was completed prior to the establishment of two National Register Historic Districts by the Port of San Francisco. Therefore, this current effort focused on parcels within and adjacent to the Waterfront Plan area that are located outside of the boundaries of the Embarcadero National Register Historic District and the Union Iron Works National Register Historic District. These districts have been designated and have policies in place that promote their preservation. No resources related to those two designated historic districts were further inventoried or documented by a + h. Port staff provided information on these two districts for the preparation of this summary report.

2. Designated and Previously Identified Historic Districts

The following are summaries of the historic districts that have previously been designated or identified within and adjacent to the Waterfront Plan area.

A. Designated Historic Districts Within the Waterfront Plan Area

The following are officially designated federal, state or local historic districts within the Waterfront Plan area, organized roughly from north to south.

Northeast Waterfront Historic District - San Francisco Article 10 Historic District

The Northeast Waterfront Historic District contains commercial warehouse buildings from nearly every decade of San Francisco's history. The area reflects the waterfront storage and maritime activities which, until recently, were an important aspect of San Francisco business history. These buildings range in age from the early clipper ship warehouses of the 1850's to the properties owned by shipbuilding companies that contributed to major Pacific maritime support during World War II. Six Seawall lots in Port jurisdiction are within this City of San Francisco locally designated historic district. These include: Lots 320, 321, 322, 322-I, 323, and 324. However, none of these Seawall Lots contain historic resources that contribute to the Northeast Waterfront Historic District.

Port of San Francisco Embarcadero - National Register Historic District

The Port of San Francisco Embarcadero Historic District encompasses three miles of

waterfront including the seawall, bulkhead wharf, pier and bulkhead buildings from Pier 45 at the north to Pier 48 at China Basin at the south waterfront. The district's period of significance is 1878 to 1946. This linear district follows the waterfront from north to south with the historic finger piers, sheds and bulkheads, as well as the Ferry Building, the Pier 29 Belt Line Railroad Annex, Cafes at Pier 23 and Pier 40-1/2, the Agriculture Building and the Fire Station at Pier 22 ½ all contributing to the overall character of the district. Portions of Pier 39 and also Piers 30-32 are non-contributing to the Embarcadero Historic District as they lack integrity. This historic district was listed in the National Register of Historic Places in May 2006.

Central Embarcadero Piers - National Register Historic District
The Central Embarcadero Piers Historic District (Piers 1-5) was listed in the National Register of Historic Places in 2002 in response to a recommendation of the State Historical Resources Commission that the Port pursue historic district designation and to allow the rehabilitation of these piers to qualify for Federal Rehabilitation Tax Credits. This district is located within and was the precursor to the Embarcadero Historic District that was listed on the National Register in 2006.

Union Iron Works at Pier 70 - National Register Historic District
The Union Iron Works Historic District at Pier 70 encompasses the 68-acre former Union Iron Works/Bethlehem Steel Shipyard between Mariposa, Illinois and 22nd Streets and is a part of the Central Waterfront, Dogpatch/Potrero Hill neighborhoods. The district's period of significance is 1884 to 1945 and includes numerous contributing industrial resources that formed the physical plant of the shipyard. A 14-acre portion of the former shipyard remains in maritime use. This historic district was listed in the National Register of Historic Places in April 2014.

India Basin Scow Schooner Boatyard Vernacular Cultural Landscape
The India Basin Scow Schooner Boatyard site, a boatbuilding and boat repair yard in operation beginning in the 1870s, is eligible for the California Register of Historical Resources under Criterion 1 for its associations with San Francisco's wood scow schooner building and repair industry that was centered at India Basin. Scow schooners were integral to the transportation of goods throughout the Bay Area during the late 19th and early 20th centuries, before the era of widespread automobile use and bridge construction. The boatyard's period of significance begins in 1875, the year that Johnson Dircks established a boatyard at the site, and extends to 1936, when the Bay Bridge between San Francisco and Oakland was completed. The bridge represents the expansion of vehicle transportation and the decline of the local shipping industry in the Bay Area, and thus also marks the end of the era in which wood watercraft (the boatyard's specialty) were integral to the Bay Area's transport economy. The character-defining features of the India Basin Scow Schooner Boatyard Vernacular Cultural Landscape include the India Basin/San Francisco Bay location itself, with a gradual slope from Innes Avenue to India Basin; views east toward the Bay and the East Bay hills; and circulation

patterns including the Griffith Street ROW, the path between Griffith Street and the west marine ways, and the circulation routes between the water access at the marine ways. Character-defining buildings and structures include the Boatyard Office building (to be demolished), Tool Shed and Water Tank building (to be demolished), the Shipwright's Cottage, the west marine way tracks, water fence posts, the Hunters Point Ship Graveyard, and the historic storage and staging yard area. The only Port properties in this geography are underdeveloped street right of ways that do not contain any historic resources. The boatyard resources are not Port-owned, managed, or maintained properties.

Auxiliary Water Supply System Historic District
The Auxiliary Water Supply System (AWSS) is a discontiguous historic district that has been determined to be eligible for listing in the National Register and California Register under Criteria A/1 and C/3 for its association with post-1906 earthquake reconstruction and engineering in San Francisco, with a period of significance of 1906 to 1913. The AWSS is a citywide gravity-fed water supply system for fire suppression that comprises numerous buildings, structures, and infrastructural features that extends across the Waterfront Plan area and beyond. Elements that contribute to the AWSS and are present within the Waterfront Plan area include four fireboat manifolds and the numerous high-pressure water hydrants within the public right-of-way along The Embarcadero, Third Street, Pier 90, and many of the cross streets. However, none of the contributing features of the AWSS Historic District is owned or managed by the Port.

B. Identified and Designated Historic Districts Adjacent to the Waterfront Plan Area

The following are designated or previously identified or formally determined eligible historic districts that are nearby or adjacent to the Waterfront Plan area. This information is based on a review of the planning department's Property Information Map and in consultation with planning department preservation staff. The historic districts discussed below are organized roughly north to south.

South End Historic District - San Francisco Article 10 Historic District
The South End Historic District is a City of San Francisco locally designated historic district that is located adjacent the South Beach area and the San Francisco Giant's Ballpark. There are no Port properties in this district, but it is immediately adjacent to Seawall Lots 331, 332 and 333. The district is comprised of warehouses with easy access to the southern waterfront. The district includes the Oriental Warehouse of the Pacific Mail Steamship Company (1867) and the Southern Pacific Warehouse (1903). This district was designated by the City of San Francisco in 1990.

Dogpatch Historic District - San Francisco Article 10 Historic District
Dogpatch is an approximately nine-block enclave of industrial workers' housing located east of Potrero Hill, in San Francisco's Central Waterfront district. The neighborhood is comprised of almost one-hundred flats and cottages, as well as several industrial, commercial, and civic

buildings, most of which were erected between 1870 and 1930. There are no Port properties in this district, but it is within a block of the Union Iron Works Historic District at Pier 70.

Central Waterfront Third Street Industrial District – California Register Eligible Historic District

The Third Street Industrial District is a sub-district of the Central Waterfront Historic District (also known as the Potrero Point Historic District) and was identified and documented by Kelley & VerPlanck and Page & Turnbull in 2008. The Third Street Industrial District is a narrow, linear district that includes the blocks bounded by 18th Street to the north, Illinois Street to the east, 24th Street to the south, Third Street to the west, and the parcels that once constituted PG&E's Potrero Power Station and the remnants of the Western Sugar Refinery. The district also includes several properties on the west side of Third Street between 20th and 22nd streets and the contiguous block bound by 19th, 20th, and Tennessee streets. The Third Street Industrial District is significant under Criterion 1 (Events) for association with the industrial development of the City of San Francisco and under Criterion 3 (Architecture) based on its collection of late nineteenth- and early twentieth-century American industrial buildings and structures that remain substantially intact. This is not a formally designated historic district. There are no Port properties in this historic district, but it is immediately adjacent to the Union Iron Works Historic District at Pier 70.

3. Individual Historic Buildings or Sites Within the Waterfront Plan Area

The following are designated or previously identified or formally determined eligible individual historic buildings or sites within the Waterfront Plan area.

Ferry Building (Union Ferry Depot), The Embarcadero at Market Street, City of San Francisco Landmark No. 90, individually listed on the National Register and California Register

Ferry Station Post Office, Agriculture Building, The Embarcadero at Mission Street, individually listed on the National Register and California Register

Beltline Roundhouse Complex, 1500 Sansome Street, City of San Francisco Landmark No. 114, individually listed on the National Register and California Register

Pier One, The Embarcadero at Washington Street, individually listed on the National Register and California Register

Fireboat House (Fire Station No. 35), Pier 22 ½, City of San Francisco Landmark No. 225, determined individually eligible for listing on the National Register

Kneass Boatworks Building, 671 Illinois Street, determined eligible for listing on the National Register and California Register

Fire House No. 25, 3305 3rd Street, determined eligible for listing on the National Register, listed on the California Register

Fisherman's Grotto No. 9, 2581 Taylor Street and 206 Jefferson Street, determined eligible for listing on the California Register

Fourth Street Bridge (reconstructed), Fourth Street at Mission Creek Channel, determined eligible for listing on the California Register
Pier 50 Office Building, Pier 50, determined eligible for the California Register
Pier 52, Atchison Topeka & Santa Fe Railroad Car Ferry Slip, determined eligible for listing on the California Register
Francis "Lefty" O'Doul/Third Street Bridge, City of San Francisco Landmark No. 194

4. Individual Historic Buildings or Sites Immediately Adjacent to the Waterfront Plan Area

Aquatic Park National Historic Landmark, administered by the National Park Service, including ships in this location, listed on the National Register and California Register, Adjacent to the Fisherman's Wharf subarea

Haslett Warehouse (Argonaut Hotel), 680 Beach Street, National Park Service with long-term lease, listed on the National Register and California Register, City of San Francisco Landmark No. 59, Adjacent to the Fisherman's Wharf subarea

Otis Elevator Co., 1 Beach Street, listed on the National Register and California Register, Adjacent to the Fisherman's Wharf subarea

Merchant's Ice and Cold Storage Co., 1 Lombard Street, listed on the National Register and California Register, Adjacent to the Northeast Waterfront subarea

Italian Swiss Colony Warehouse, 1265 Battery Street, City of San Francisco Landmark No. 102, Adjacent to the Northeast Waterfront subarea

Gibb-Sanborn Warehouse (South-Trinidad Bean and Elevator Company), 855 Front Street, City of San Francisco Landmark No. 91, Adjacent to the Northeast Waterfront Subarea

Gibb-Sanborn Warehouse (North-Pelican Paper Company), 901 Front Street, listed on the National Register and California Register, City Landmark No. 92, Adjacent to the Northeast Waterfront Subarea

Fuller Company Glass Warehouse, 50 Green Street and 1001 Front Street, listed on National Register and California Register, Adjacent to the Northeast Waterfront Subarea

Embarcadero Plaza, San Francisco Recreation & Park Department, eligible for listing on the National Register and California Register, Adjacent to the Northeast Waterfront subarea

Audiffred Building, 1–21 Mission Street, listed on the National Register and California Register, City of San Francisco Landmark No. 7, Category I building (Article 11), Adjacent to the Northeast Waterfront subarea

Rincon Annex Post Office, 99 Mission Street, City of San Francisco Landmark No. 107, Adjacent to the Northeast Waterfront subarea

Army-Navy (Embarcadero) YMCA, 166–169 The Embarcadero, eligible for listing on the National Register, Category II building (Article 11), Adjacent to the Northeast Waterfront subarea

Hills Brothers Coffee Plant, 2 Harrison Street, City of San Francisco Landmark No. 157, Adjacent to the South Beach subarea

Joseph Magnin Warehouse, 1–35 Harrison Street, eligible for listing on the California Register, Adjacent to the South Beach subarea

Oriental Warehouse, 650 Delancey Street, eligible for listing on the National Register, City of San Francisco Landmark No. 101, Adjacent to the South Beach subarea

Hunters Point Springs and Albion Brewery, 881 Innes Avenue, City of San Francisco Landmark No. 60, Adjacent to the Southern Waterfront subarea

Shipwright's Cottage, 900 Innes Avenue, City of San Francisco Landmark No. 250, Adjacent to the Southern Waterfront subarea

702 Earl Street, eligible for listing on the National Register and California Register, Adjacent to the Southern Waterfront subarea

5. Potential Future Development Sites Identified in the Port of San Francisco Waterfront Plan

"Soft sites" or potential future development sites identified in the Port of San Francisco Waterfront Plan (December 2019) include the following sites from north to south:

Seawall Lot 314 – Bounded by Embarcadero, Bay and Kearny Streets. This lot currently contains surface parking; no built resources. However, there was a former gas station on this site. Across the street from the Embarcadero Historic District and the North Point Sewage Treatment Plant (Located within Waterfront Plan Subarea: Northeast).

Seawall Lot 321 – Bounded by Embarcadero, Green, Union and Front Streets. This lot currently contains surface parking; no built resources. This parcel is a non-contributing property within the Northeast Waterfront Historic District, at the northeast corner of the district (Located within Waterfront Plan Subarea: Northeast).

Piers 30-32 – These two piers were not included in the Embarcadero Historic District boundary as they lacked integrity. The Bulk Head Wharf at this location is contributing to the Embarcadero Historic District. Further, Red's Java House, while outside the boundary of the Embarcadero Historic District has been determined to be a potential non-contiguous contributor to the historic district, eligible for listing on the California Register and a historic resource under CEQA. A surface parking lot covers the majority of Piers 30-32 (Located within Waterfront Plan Subarea: South Beach).

Seawall Lot 330 – Bounded by Embarcadero, Beale, Main and Bryant Streets. This lot currently contains surface parking; no built resources. This parcel is across the street from the Embarcadero Historic District (Located within Waterfront Plan Subarea: South Beach).

Pier 70 "Triangle" – This is an open area of Pier 70 is located within the boundaries of the National Register District, but that does not contain any built resources and the open area was not identified as character-defining to the historic district. District contributors are immediately adjacent to this area. However, contributing elements of the historic district are located immediately adjacent (Located within Waterfront Plan Subarea: Southern Waterfront).

Piers 90-94 Backlands – This is an area on the south side of Islais Creek currently occupied by a mix of maritime and building construction materials companies. The site contains the former Pier 90 Grain Elevators which are not in use. An historic resources evaluation was completed for the Port of the Pier 90 site in January 2018 by ARG and no historic resources were identified. The San Francisco Planning Department and the Port of San Francisco concurred with the findings of the ARG report. The Pier 90-94 Backlands is a largely undeveloped area upland of the maritime and construction company uses (Located within Waterfront Plan Subarea: Southern Waterfront).

These sites and their potential for historic resources are discussed more fully below in their corresponding Waterfront Plan Subarea. The Seawall Lots that contain no built resources are not discussed further. However, it is assumed that, given their close proximity to the Embarcadero Historic District, any future development would be reviewed for compatibility with using *the Secretary of the Interior's Standards for the Treatment of Historic Properties*.

6. Waterfront Plan Subareas

There are five subareas delineated in the Waterfront Plan area. Below is a brief description of the subarea, the previously identified historic resources in the subarea, and recommendations for further study or documentation of potential historic resources within each subarea.

FISHERMAN'S WHARF: Aquatic Park to Pier 39

Fisherman's Wharf - Brief Description
Developed at the turn of the twentieth century, Fisherman's Wharf was moved from its previous location at the base of Union Street, near Pier 17 today, to accommodate larger-scale operations at the earlier site. Today, Fisherman's Wharf is a blended mix of commercial fishing uses with tourist destinations, restaurants, shopping and entertainment venues.

Fisherman's Wharf - Previously Identified Historic Resources
Within the Waterfront Plan area, this subarea contains the Fish Alley Architectural Character District[1] and portions of the National Register of Historic Places Embarcadero Historic District and is immediately adjacent to properties administered by the National Park Service.

Fisherman's Wharf - Recommendations for Further Study of Historic Resources

Post War Tourism Historic Context
This area of the city would benefit from the development of a Fisherman's Wharf-San Francisco Port World War II Tourism Context Statement. This would include areas and resources that are not under Port jurisdiction, but it would chronicle the history and development of Fisherman's Wharf as a tourist destination. This would include nearby hotels and motels, restaurants, the conversion of the Ghirardelli Chocolate Factory and form Canneries to shops and restaurants, and the development of the Hyde Street Pier for mooring historic ships by the National Park Service in 1963. Resources such as the Franciscan Restaurant, constructed in 1957 by the Port on Seawall Lot B, represent the Port's Post-War development into non-maritime, more tourist-oriented businesses.

NORTHEAST WATERFRONT: Pier 35 to Pier 14

Northeast Waterfront - Brief Description
Following the demolition of the Embarcadero Freeway in 1990, several successful, high-profile rehabilitation projects along The Embarcadero have opened the historic piers to the public with modern uses while preserving the area's historic maritime character. Today, the Northeast Waterfront subarea is a public open space network and a regional transportation gateway between San Francisco and the Bay Area.

Northeast Waterfront - Previously Identified Historic Resources
Within the Waterfront Plan area, this subarea contains portions of the Embarcadero Historic District and is immediately adjacent to the Northeast Waterfront Historic District designated under Article 10 of the City of San Francisco's Planning Code. Six Port Seawall lots also are located within the Northeast Waterfront Historic District. These include: Lots 320, 321, 322, 322-I, 323, and 324. However, none of these Seawall Lots contain historic resources that contribute to the Northeast Waterfront Historic District. This area also has several individual City Landmarks, including the Ferry Building (City of San Francisco Landmark No. 90) and the Belt Railroad Round House (City of San Francisco Landmark No. 114).

[1] The Fish Alley Architectural Character District (which is described on pages 61–62 of the Waterfront Plan) guides Port design review of alterations or new additions in the Fish Alley area. An architectural character district is not a historic resource.

Northeast Waterfront - Recommendations for Further Study of Historic Resources

Fog City Diner – 1300 Battery Street – Seawall Lot 319
It does not appear that the Fog City Diner building has ever been fully evaluated as a potential historic resource. The building has been substantially altered and added to within the last 20 years, but the original portion of the building apparently dates to the 1930s.

Building Type Study - Office Parks along the Embarcadero
Several multi-building, low rise, office parks with significant landscaping components developed along the Embarcadero from the late 1960s into the mid-1970s. These complexes are nearing or are now 50 years in age. Some of these developments are on Port properties and others are not. These complexes do form a potential grouping and should be understood collectively. What was the driving force behind developing these somewhat suburban developments in the heart of San Francisco? The building's low-scale character was likely one factor in their placement along the northern waterfront; the horizonal bulk rather than vertical height did not block views to and from the waterfront. These buildings string along the Embarcadero and are nestled below Telegraph Hill from Vallejo Street north to where the Embarcadero meets Beach Street.

SOUTH BEACH: Rincon Park to the Giants Ballpark

South Beach - Brief Description
Under the Rincon Point-South Beach Redevelopment Plan, development of South Beach Harbor and Marina initiated the conversion of this former heavy maritime industrial area to a lively mixed-use neighborhood just south of the Bay Bridge. Within this subarea several of the historic finger piers contribute to the Embarcadero Historic District including Piers 26, 26 ½, 28 and 38. The Giants Baseball Stadium is also a defining feature of this area of the Waterfront.

South Beach - Previously Identified Historic Resources
Within the Waterfront Plan Area, this subarea contains portions of the Embarcadero Historic District and is immediately adjacent to the South End Historic District designated under Article 10 of the City of San Francisco's Planning Code. The Pier 22½ Fireboat Station 35, south of Rincon Park, is a city landmark.

South Beach - Recommendations for Further Study of Historic Resources

Red's Java House
This building is a remnant of the support services found along the Waterfront catering to longshoreman, fisherman, mariners and sailors. It is one of three surviving waterfront cafes from the 1930s that served as the gathering place for waterfront workers. While outside the boundary of the Embarcadero Historic District, Red's has been determined to be a potential

non-contiguous contributor to the historic district, eligible for listing on the California Register, and a historic resource under CEQA. It should be carefully considered with regard to any new development at Piers 30-32.

MISSION BAY: China Basin to Mariposa Street

Mission Bay - Brief Description
This is San Francisco's newest neighborhood. It is home to both the San Francisco Giants Stadium (Oracle Park) and the Golden State Warriors Arena (Chase Center). The subarea also houses significant medical and research facilities, as well as new recreational facilities including Waterfront focused activities such as boating and kayaking. The neighborhood is a compelling mix of old and new, large-scale and smaller-scale resources.

Mission Bay - Previously Identified Historic Resources
Within the Waterfront Plan area, Pier 48 is the southern-most contributor to the Embarcadero Historic District. Mission Bay is situated between the south portion of the Embarcadero Historic District and the Union Iron Works Historic District at Pier 70.

Mission Bay - Recommendations for Further Study of Historic Resources

Pier 50 and Pier 50 Office Building
The VerPlanck Preservation Consulting Historic Resources Report for Seawall Lot 337 and Pier 48 (Case No. 2013.0208E) discussed Pier 50 noting:

> Pier 50 has no formal historic status at the national, state, or local level. Because it was expanded and significantly altered after 1946, the end of the period of significance for the Port of San Francisco Embarcadero Historic District, Pier 50 was excluded from the historic district boundaries. The property was also not evaluated in any of the earlier waterfront surveys completed in the 1990s or 2000s, likely because it was less than 50 years old at the time. Pier 50 does not appear to be a historic resource because has been significantly altered many times and no longer embodies the characteristics of any particular period of construction.

VerPlanck notes that the Pier 50 Office Building may be a potential individual historic resource. The DEIR for the recent project at this site, stated that the Pier 50 office building is a potential historic resource under CEQA.

Pier 52
The historic resource evaluation prepared for the Seawall Lot 337 and Pier 48 Mixed-Use Project EIR (Case No. 2013.0208E) noted: "South of the Mariposa-Hunters Point Yacht Club is a small public pier [(i.e., Pier 52 boat launch)] used for launching kayaks and other small watercraft. The $3.5 million, two-lane boat launch opened in 2008, replacing a single-lane

facility constructed in the 1950s. The structure consists of a wood pier with metal railings and pilings. The property does not contain any historic resources." While the boat launch is not of historic age (i.e., 45 years or older), Pier 52 (extant) was constructed ca. 1946–1956 and is age eligible to be considered a potential historic resource under CEQA.

Yacht and Boating Clubs
There are several older Yacht and Boat clubs in this area of the waterfront that do not appear to have been fully evaluated as historic resources. Some of these building may not be on Port property but the recreational boating and small boat repair historic context of resources in this vicinity is worthy of further study. The VerPlanck Preservation Consulting Historic Resources Report for Seawall Lot 337 and Pier 48 (Case No. 2013.0208E) discussed one of these buildings noting: "it may warrant special consideration in local planning because it is a rare example of a yacht club built by and for working-class shipyard workers." This collection of clubs may require further evaluation.

House Boats of Mission Creek
There are approximately 20 house boats that occupy slips along the south side of Mission Creek. These house boats are personal, movable property, but they are located within slips that are maintained and administered by the Port of San Francisco. These house boats have never been evaluated as historic resources, but they are individually owned and movable vessels.

SOUTHERN WATERFRONT: Crane Cove Park to India Basin

Southern Waterfront - Brief Description
The Southern Waterfront continues to house the Port of San Francisco's cargo shipping and heavy industrial maritime operations. As such, it has a strong industrial character, and the historic resources in this subarea reflect changing innovations in shipping, maritime industry, and manufacturing over the last century. This subarea is ripe for redevelopment, greening and re-shaping how the land is used and how the Port will shape its maritime partnerships in the years to come.

Southern Waterfront - Previously Identified Historic Resources
Within the Waterfront Plan area, this subarea includes the Union Iron Works National Register of Historic Places Historic District at Pier 70. This area is also adjacent to the Dog Patch Historic District designated under Article 10 of the City of San Francisco's Planning Code.

Southern Waterfront - Recommendations for Further Study of Historic Resources
Of all the Waterfront Plan subareas, this one has the most sites that may require assessment or re-assessment of potential historic resources. Each is described below.

Kneass Building
Kneass Boat Works Building at 671 Illinois Street between Mariposa and 18th Streets, south of Mission Bay. This building is a survivor of the small boat building and repair industry that once occupied the Central Waterfront. Prior to any significant project, including a stabilization project, this building should receive a full historic resources evaluation. While there are previous DPR forms on this building, the information provided on the forms is not very detailed and includes some outdated information. Based on past evaluations the Kneass Building appears eligible for the California Register of Historical Resources.

Fire House No. 25
This John Reid, Jr.-designed City of San Francisco fire station sits on Port lands but is owned and administered by the San Francisco Fire Department. It is located on the north side of Islais Creek near 3rd Street. As summarized in the *San Francisco Stations Historic Resource Study* prepared by Page & Turnbull in 2015, the building was evaluated by Carey & Co. in 1994, and a project for a rear addition was reviewed by the San Francisco Landmarks Preservation Advisory Board (the precursor to the Historic Preservation Commission) in 1996. The building was determined eligible for listing on the National Register and also for local listing, and it was listed on the California Register. The building is a historic resource.

Pier 80 – The Army Street Terminal
Developed between 1958, when initial bonds were approved to fill lands between Twenty-Fifth Street and the north side of Islais Channel, and 1970, Pier 80 was a large quay-type terminal. There were transit sheds around the perimeter and areas for rail and truck use and transport at the center of this large pier. A major project in 1974 involved removal of Shed B, removal of the Shed C portion of Shed C-D, leaving Shed D, and structural modifications to the wharf that surrounds the Pier 80 site on the North, East, and West sides. This site also includes an office building at the base of Cesar Chavez Street (formerly Army Street) where it intersects with Maryland Avenue. More research is required to identify architects and designers or to determine whether the facility was designed by Port engineering staff. These resources have not been fully evaluated for historic significance and as they are now 50 years in age a study, that includes an assessment of the historic integrity of the site as a whole, should be conducted.

Pier 84 and the Copra Crane
In 1946, plans were executed by the Port to establish the Islais Creek Copra Terminal at Pier 84. Copra is the sun-dried meat of coconuts, which was used for food, soap making, oils, animal feed and other uses. The Terminal was located on the north side of Islais Creek, west of Third Street. A crane, which sat on the south side of Islais Creek, was used to hoist large sacks of copra-based animal feed onto ships. The Copra Crane was identified as an eligible historic resource in the 2001 Central Waterfront Cultural Resources Survey and was disassembled by the Port to allow the reconstruction of the failing wharf substructure. The Port's initial plan to reinstall the crane was the result of a partnership and financial support

from the Copra Crane Labor Landmark Association. Subsequently the organization dissolved and the Port lacks funding to support the original project. The crane has been salvaged for scrap metal. Islais Creek Park, on the north side of Islais Creek, is located where the Copra Crane was once situated.

Pier 90-94
A historic resources evaluation for the Pier 90 portion of this area was completed by ARG in 2018. The evaluation concluded that there are no historic resources present. The Port initiated the evaluation of this resource because it was contemplating a project that would involve demolition of the grain silos; however, a project has not been fully defined. The San Francisco Planning Department has reviewed the historic resources evaluation and confirmed in an HRER Part I for Pier 90 that no historic resources are present on the site (HRER Part I dated March 31, 2021). There are other buildings, structures, and complexes on the remaining portions of this area that may require further evaluation.

Pier 96
The resources at Pier 96 may be related to the LASH (Lighter Aboard Ship) Terminal commenced operations in 1972 and will be fifty years in age by 2022. This complex that included waterside and warehouse upland features has not been fully evaluated and its historic context within the development of shipping systems should be more fully developed and understood. As discussed in Corbett's *Port City,* the port touted this as the "first home in the world of the revolutionary LASH shipping concept…The totally new LASH concept uses water to move, not only container filled ships, but the containers themselves." The large ships anchored in deep water would discharge 500-ton lighters on special barges that would convey shipping containers between ship and shore. The ships had large gantry cranes for loading. Corbett further notes: "However, the widespread adoption of a simpler container system instead of LASH and the failure of Pacific Far East Lines left the Port with a large, expensive, unused facility. First user Pacific Far Eastern Line, then Stevedore; SFPD now uses site as well. There was a Supplemental HRE completed by Port of SF dated June 2018. These resources are just turning 50 years in age and if there is a project proposed at this site a full Historic Resource Evaluation should be conducted.

7. Port of San Francisco Historic Resources Inventory Update

In addition to this summary report, a Port of San Francisco Historic Resources Inventory Update has been developed as an Excel Workbook. This effort is an update of the 1996 *Port of San Francisco Historic Resources Data Base* and was undertaken to help inform the Draft Environmental Impact Report for the Waterfront Plan published in December 2019. The inventory update is intended for internal use by the Port and Planning Department and is not available to the public.

It is important to note that this effort reviewed all sites within and adjacent to Port properties that are **NOT** included in either the Port of Embarcadero Historic District or the Union Iron Works Historic District at Pier 70. The focus of this inventory update was on above-ground, built resources; no effort was made to document previously identified archaeological sites, as this information is usually not provided for general public use. For reference, pre-existing information on the Embarcadero Historic District and the Union Iron Works Historic District has been provided by the Port.

The methodology used to update the 1996 database included site visits to Port properties, employing Google Earth and Street views of Port properties, and review of historic Sanborn maps for areas within Port jurisdiction. Review of the 1990 Sanborn fire insurance maps on the Planning Department's Property Information Map (PIM) provided a comparison of Port properties from approximately 30 years ago. Further, many of San Francisco's environmental review documents related to Port properties or projects near Port properties were obtained and viewed for relevant information.

"Soft sites" or potential future development sites identified above are shown in the inventory update in yellow highlighting. The notes column provides current conditions and provides a brief summary of recommendations for any additional historic resource evaluations. However, those are more detailed in the preceding pages and are discussed in each Waterfront Plan subarea.

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APPENDIX E

Waterfront Plan EIR – Estimation of Proposed Travel Demand

LCW Consulting

Adavant Consulting

Memorandum

To: Sherie George – San Francisco Planning Department

From: José I. Farrán – Adavant Consulting
Luba Wyznyckyj – LCW Consulting

Date: January 28, 2022 **FINAL VERSION**

Re: Waterfront Plan EIR – Estimation of Proposed Project Travel Demand

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This memorandum presents the methodologies and assumptions used to estimate the travel demand for the proposed Waterfront Plan (proposed project). Travel demand refers to trips from people walking, bicycling, riding transit, and driving that would be generated by the proposed project; this memorandum summarizes the travel demand associated with the proposed project by the various ways people travel.

Results of the travel demand analysis documented in this memorandum will be used as input into the transportation, air quality, and noise analyses for the environmental impact analysis for the Waterfront Plan Environmental Impact Report (the "EIR"). For the EIR analysis, changes in land uses and activity on waterfront parcels within the Port of San Francisco's (Port) jurisdiction[1] as anticipated that could result from implementation of the Waterfront Plan is being analyzed at a program-level basis. The Waterfront Plan does not include any changes to the transportation-related public right-of-way.

The travel demand analysis focuses on developing trip generation estimates and trip assignments for the three scenarios that will be analyzed in the EIR, which are:

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[1] Parcels under Port jurisdiction include parcels where the Port may pursue leases, development agreements, and shoreline restoration and improvement projects for maritime, industrial, commercial, recreational, environmental sustainability, and other purposes.

- Existing baseline conditions (Year 2020)[2]
- Existing plus Waterfront Plan conditions: a near-term assessment of conditions with the Waterfront Plan
- 2050 cumulative future conditions: a cumulative assessment of year 2050 conditions, including the Waterfront Plan.[3]

1.1 Overview of the Waterfront Plan Project

The Port's waterfront lies within the Port's 7.5-mile jurisdiction, a continuous shoreline from the curved northeast shore adjacent to Aquatic Park in Fisherman's Wharf to Heron's Head Park near India Basin in the southeast. The waterfront is bounded to the north by the Russian Hill and North Beach neighborhoods and to the south by the Bayview and India Basin neighborhoods. The Waterfront Plan divides the waterfront into the northern waterfront and southern waterfront areas, which are further subdivided into five subareas.

The Waterfront Plan would update and amend the 1997 Waterfront Land Use Plan, which sets long-term goals and policies to guide the use, management, and improvement of those properties under the Port's jurisdiction, from Fisherman's Wharf to India Basin (see **Figure 1**, Project Location Map).

The Waterfront Plan provides a long-range policy framework to guide future Port improvement projects, programs, and stewardship initiatives. Nine goals and policies that provide direction for managing and improving the waterfront throughout its jurisdiction would guide future leasing and development along the Port's waterfront. Goals and policies include but are not limited to preservation and enhancement of the waterfront's function as a maritime port, hosting a diversity of activities and people, enhancing public access and open space along the waterfront, the design of quality new development and preservation of the waterfront's historic character, strengthening the Port's resilience to climate change impacts, and cultivating an environmentally sustainable port to limit the impacts of climate change.

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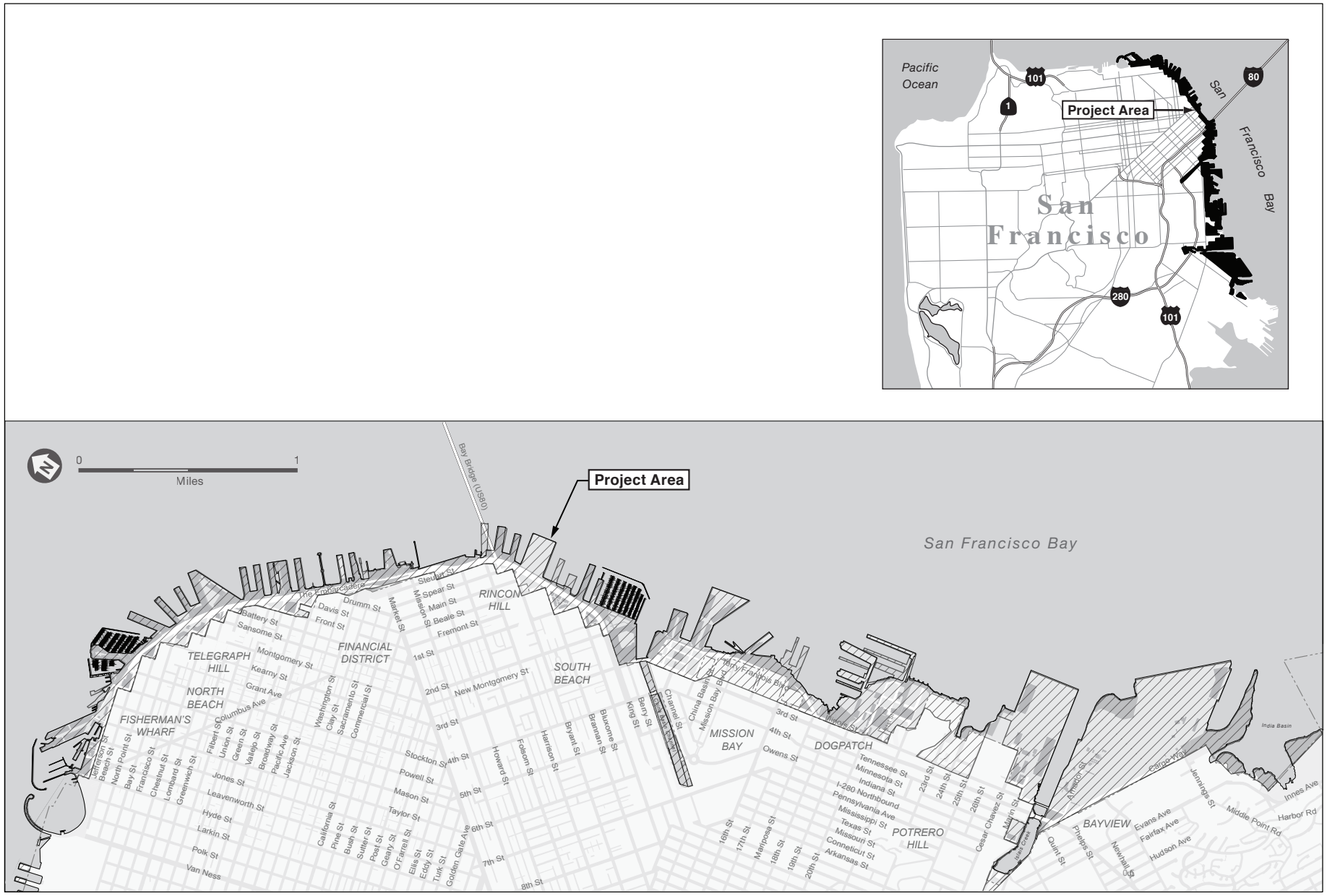
[2] Existing baseline conditions reflect the Port's lease roll data of gross square footage by land use type for all Port leases as of January of 2020 (see **Attachment A**). The existing baseline conditions also include development or infrastructure projects under construction, and those that have already completed CEQA review.

[3] Includes future growth in San Francisco and the Bay Area by 2050, based on currently approved and planned development. It does not include additional future growth that could occur as a result of the ongoing San Francisco Housing Element 2022 Update planning process.



SOURCE: Port of San Francisco, Waterfront Plan, June 2019

Waterfront Plan

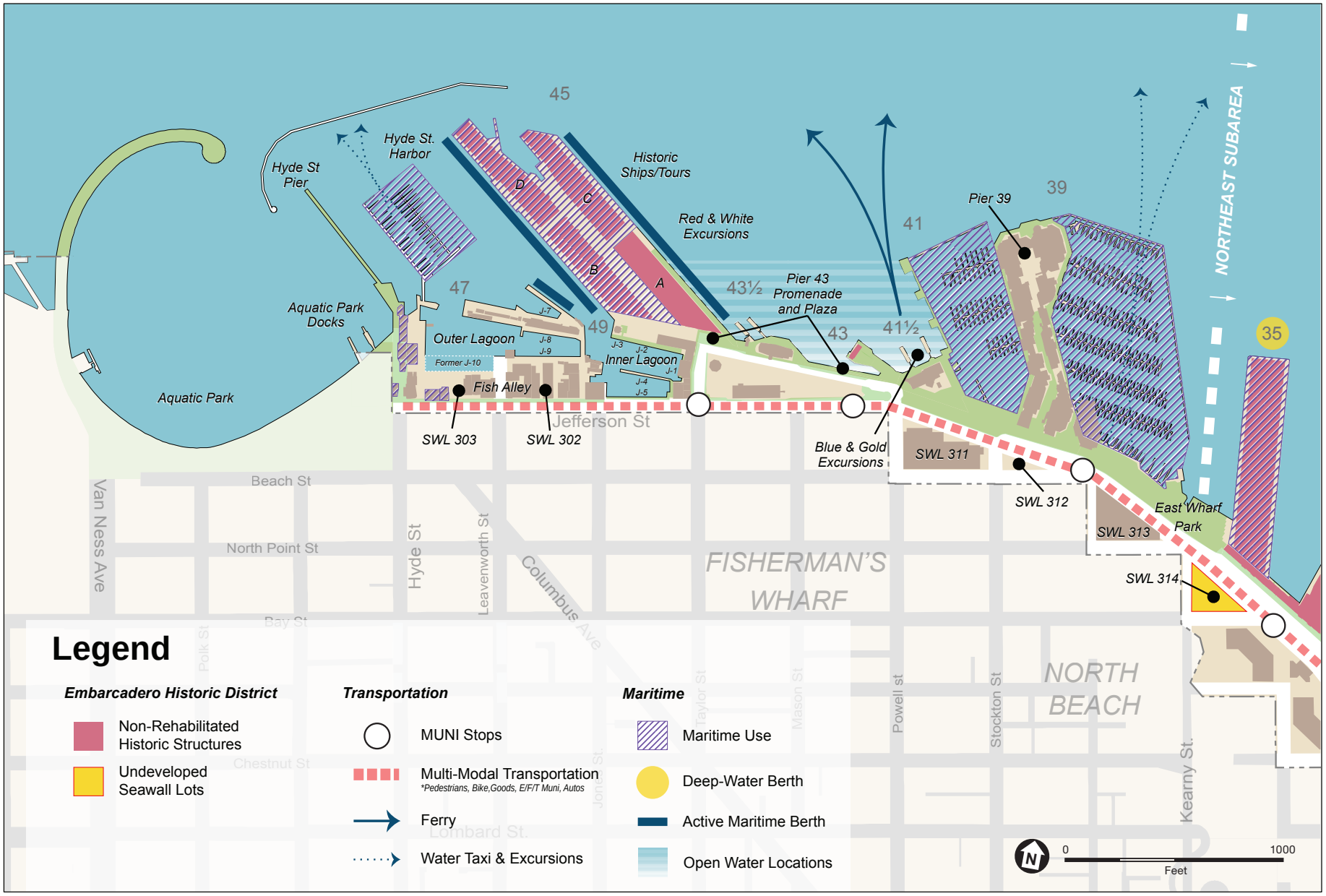
Figure 1
Project Location Map

Under the Waterfront Plan the Port may pursue leases, development agreements, and shoreline restoration and improvement projects for maritime, industrial, commercial, recreational, environmental sustainability, and other purposes over a 20+ year timeframe. The Waterfront Plan does not directly result in physical changes from, or include, specific development projects. Therefore, a future maximum growth potential under the Waterfront Plan was developed by the Port and the San Francisco Planning Department (planning department) for those parcels under Port jurisdiction based upon leasing, development, and waterfront improvements (subsequent projects) that could occur under the proposed update to the Waterfront Plan. The growth potential established a maximum number of housing units and jobs by a range of general types of employment that could be reached within each parcel. These were in turn aggregated at the Transportation Analysis Zone (TAZ)[4] and waterfront subarea levels. **Figure 2** through **Figure 6** present the boundaries of the TAZs within the five waterfront subareas.

The projected changes in land uses at the TAZ level were used as inputs into the San Francisco County Transportation Authority's (SFCTA) San Francisco-Chained Activity Modeling Process travel demand model (SF-CHAMP model) to develop travel demand estimates. **Attachment A** summarizes the number of housing units and job types within the Waterfront Plan TAZs for each of the three analysis scenarios (existing, existing plus Waterfront Plan, and 2050 cumulative conditions).

Within the waterfront subareas, the TAZs boundaries do not always align with the boundaries of the parcels under Port jurisdiction and therefore some of the TAZs also include non-Port jurisdiction parcels. For example, on **Figure 2** all parcels within TAZ 855 are within the Port jurisdiction, and do not include any non-Port parcels, while within TAZ 851 there are parcels both within Port jurisdiction and outside of the Port jurisdiction. To identify the effects of the proposed project on changes in travel demand for the Waterfront Plan EIR analyses, the Port and planning department staff developed land use changes only for those parcels on any given TAZ that are within the Port jurisdiction and left unchanged the portion corresponding to parcels outside of the Port jurisdiction. Overall, the Port developed potential changes in in employment and housing units for a portion or all of 28 TAZs along the waterfront.

[4] Transportation Analysis Zones (TAZs) are geographical areas used by planners when developing travel demand forecasting models for transportation analyses and other planning purposes. The TAZs used to develop travel demand estimates in San Francisco vary in size from single city blocks in the downtown core, to multiple blocks in outer neighborhoods, to even larger zones in historically industrial areas. They are the smallest geographical unit for which land use or travel information can be obtained from a travel demand forecasting model.



SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 2
Fisherman's Wharf Subarea

SOURCE: Port of San Francisco, Waterfront Plan, 2019

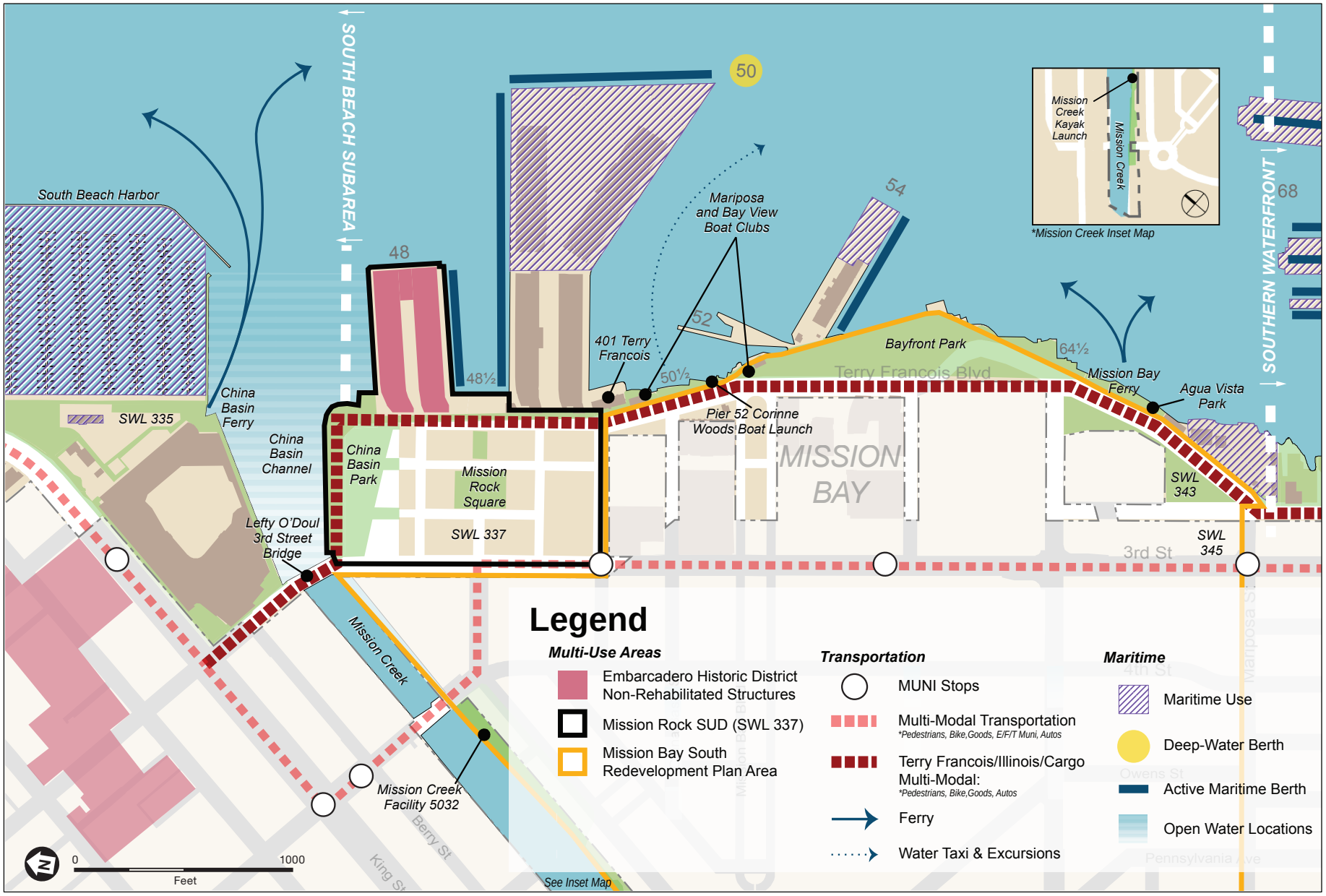
Waterfront Plan Update

Figure 3
Northeast Waterfront Subarea

SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 4
South Beach Subarea



SOURCE: Port of San Francisco, Waterfront Plan, 2019

Waterfront Plan Update

Figure 5
Mission Bay Subarea

Table 1, Employment and Housing Units by Waterfront Subarea for Existing and 2050 Cumulative Conditions, presents employment and housing units for the five subareas for existing, existing plus Waterfront Plan, and 2050 cumulative conditions; in addition, it also quantifies the net change under the Waterfront Plan. The employment and housing unit information is separately provided for parcels within the Port jurisdiction and parcels outside of the Port jurisdiction, but which are within the TAZs included in the study area. Combined, the land uses on parcels within the Port jurisdiction and on non-Port jurisdiction parcels in the 28 TAZs represent the total land uses within each of the five subareas.

Existing Conditions. As shown in **Table 1**, of the approximately 27,330 existing jobs in the waterfront area, 12,910 jobs are on parcels under Port jurisdiction (47 percent) and 14,420 jobs are on parcels not under Port jurisdiction (53 percent). Of the 1,923 existing housing units within the waterfront area, only 410 units (21 percent) are on parcels within the Port jurisdiction, while the majority, 1,513 units (79 percent), are on non-Port parcels.

Existing plus Waterfront Plan. Under existing plus Waterfront Plan conditions, subsequent projects under the Waterfront Plan would add on those parcels within Port jurisdiction approximately 14,800 new jobs (a 115 percent increase compared to existing conditions) and 255 new housing units (a 62 percent increase compared to existing conditions). The greatest job increase would be in the Northeast Waterfront/Ferry Building and South Beach/China Basin subareas (about 85 percent of the total job increase). Of the 14,800 new jobs, approximately 11,570 (78 percent) would be under the Management, Information, Professional Services (MIPS) category, while 1,750 (12 percent) would be under the Cultural, Institutional and Educational (CIE) category. The remaining 10 percent of employment growth would occur under the retail, Production, Distribution, and Repair (PDR) and visitor categories.[5] Development of 255 housing units would all occur within the South Beach/China Basin subarea, specifically at Seawall Lot 330 across Piers 30/32. Thus, under existing plus Waterfront Plan conditions, 66 percent of the jobs in the waterfront area would be on parcels within the Port jurisdiction (compared to 47 percent under existing conditions) and 31 percent of housing units would be on parcels within the Port jurisdiction (compared to 21 percent under existing conditions).

[5] The employment categories used in the SF-CHAMP model include MIPS (Management/Information/Professional Services), CIE (Cultural/Institutional/Educational), PDR (Production/Distribution/Repair), Medical, Retail, and Visitor oriented jobs. A detailed breakdown of existing and future employment assumptions by SF-CHAMP job categories is included in **Attachment A**.

TABLE 1
EMPLOYMENT AND HOUSING UNITS BY WATERFRONT SUBAREA FOR 2020 AND 2050 CUMULATIVE CONDITIONS [a]

Land Use/Waterfront Subarea	2020 Conditions							2050 Cumulative Conditions		
	Existing			Existing plus Project			Net Change under Waterfront Plan			
	Port Jurisdiction [b]	Non-Port Parcels [c]	Total Waterfront Area [d]	Port Jurisdiction	Non-Port Parcels	Total Waterfront Area		Port Jurisdiction	Non-Port Parcels	Total Waterfront Area [d]
Employment (jobs)										
Fisherman's Wharf	4,651	667	5,318	5,023	667	5,690	372	4,994	777	5,771
Northeast Waterfront/Ferry Bldg.	3,337	3,734	7,071	8,068	3,734	11,802	4,731	8,489	3,783	12,272
South Beach/China Basin	1,869	6,832	8,701	10,570	6,832	17,402	8,701	10,571	6,814	17,385
Mission Bay	736	0	736	781	0	781	45	6,522	0	6,522
Southern Waterfront	2,315	3,185	5,500	3,263	3,185	6,448	948	12,592	6,691	19,283
Total	**12,908**	**14,418**	**27,326**	**27,705**	**14,418**	**42,123**	**14,797**	**43,168**	**18,065**	**61,233**
Percentage of Total	47%	53%	100%	66%	34%	100%		70%	30%	100%
Housing Units										
Fisherman's Wharf	0	495	495	0	495	495	0	0	500	500
Northeast Waterfront/Ferry Bldg.	125	516	641	125	516	641	0	125	546	671
South Beach/China Basin	285	124	409	540	124	664	255	540	385	925
Mission Bay	0	0	0	0	0	0	0	1,327	0	1,327
Southern Waterfront	0	378	378	0	378	378	0	4,951	1,975	6,926
Total	**410**	**1,513**	**1,923**	**665**	**1,513**	**2,178**	**255**	**6,943**	**3,406**	**10,349**
Percentage of Total	21%	79%	100%	31%	69%	100%		67%	33%	100%

NOTES:

a. Reflects conditions within the 28 TAZs that make up the waterfront area, includes parcels within and outside of Port jurisdiction.

b. Port jurisdiction includes land use parcels within the subarea TAZs where the Port may pursue leases, development agreements, and shoreline restoration and improvement projects for maritime, industrial, commercial, recreational, environmental sustainability, and other purposes.

c. Non-Port parcels include land use parcels within the subarea TAZs not subject to Port jurisdiction (e.g., private or City-owned)

d. Total waterfront area includes all land uses within the subarea TAZs.

SOURCES: San Francisco Planning Department, Port of San Francisco, 2021

2050 Cumulative Conditions. Table 1 also presents the land use amounts for 2050 cumulative conditions. Under 2050 cumulative conditions, the total number of jobs within the waterfront area would be approximately 61,230 while the total number of housing units would be about 10,350 units. The increase in employment and housing units from existing conditions represents both expected leasing and development under the Waterfront Plan, as described above, as well as approved and projected development within the 28 TAZs in the waterfront area on parcels within and outside of the Port jurisdiction.

Between existing and 2050 cumulative conditions there would be approximately 33,910 additional jobs (124 percent increase) and about 8,430 additional housing units (538 percent increase) within the waterfront area. Under 2050 cumulative conditions 70 percent of the total jobs within the waterfront area would be on parcels within the Port jurisdiction (i.e., 12,910 existing jobs, 14,800 jobs as part of the Waterfront Plan, and 15,460 jobs as part of approved development projects such as Mission Rock and the Pier 70 projects), compared to 47 percent under existing conditions. In addition, under 2050 cumulative conditions 67 percent of the total housing units within the waterfront area would be on parcels within the Port jurisdiction (i.e., 410 existing units, 255 units as part of the Waterfront Plan, and about 6,280 units as part of approved development projects) compared to 21 percent under existing conditions.

As shown on **Table 1**, under 2050 cumulative conditions, the three subareas with the greatest increases in employment from existing conditions would be within the Southern Waterfront, South Beach/China Basin, and Mission Bay subareas. The three subareas with the greatest increases in housing units from existing conditions would be in Southern Waterfront, Mission Bay, and South Beach/China Basin subareas.

Overall, the Waterfront Plan would contribute 44 percent to the projected increase of the approximate 33,910 jobs within the waterfront area between existing and 2050 cumulative conditions, and 2.5 percent to the projected increase of about 8,430 housing units.

1.2 Travel Demand Methodology

The SFCTA SF-CHAMP travel demand forecasting model was used to determine future travel conditions without and with the Waterfront Plan for existing plus project and 2050 conditions.

1.2.1 Use of SF-CHAMP Travel Demand Model

Travel demand associated with the Waterfront Plan's projected growth in land uses within the Port jurisdiction parcels along the waterfront were estimated based on outputs provided by the SFCTA from the SF-CHAMP model, version 6.1.2. The SF-CHAMP model is an activity-based type travel demand forecasting model. The model has been developed and improved over the years, and is validated regularly to represent existing and future trip generation, travel distribution, and trip routings in San Francisco. The SF-CHAMP model is able to estimate all person travel for on a typical day based on the total number and locations of population, housing units and employment.

The model is designed to separately estimate travel during five different periods of the day (early morning, morning commute, midday, evening commute, and late evening) using time-of-day sub-models. The SF-CHAMP model calculates person travel by five different means of transportation: automobile, transit, TNC, walking and bicycle trips. The SF-CHAMP model also forecasts vehicular traffic on regional freeways, major arterials and local streets based on origin-destination demand, available roadway capacity, and estimated travel speeds on roadway network.

SF-CHAMP divides San Francisco into 981 TAZs. It also includes TAZs outside of San Francisco, for which it uses the same geography as the current Metropolitan Transportation Commission (MTC) regional travel demand forecasting model: "Travel Model One."[6] As shown on **Figure 2** through **Figure 6** there are a total of 28 TAZs within the five study subareas.

For each TAZ, the SF-CHAMP model estimates the travel demand based on TAZ population (i.e., residents within the housing units) and employment assumptions. For the analysis of existing and future 2050 cumulative conditions in this study, the planning department's citywide, community equity, and environmental planning divisions in partnership with the SFMTA and the Transportation Authority developed housing and job estimates at the TAZ level for San Francisco and the other eight Bay Area counties. The Waterfront Plan's housing and employment assumptions for the SF-CHAMP model were developed with the Port and are consistent with the planning department's projections estimated methods.

1.2.2 SF-CHAMP Analysis Scenarios

The SF-CHAMP model was used to estimate travel demand for the following four scenarios:

- 2020 existing conditions
- 2020 existing conditions plus development under the Waterfront Plan
- 2050 cumulative conditions without development under the Waterfront Plan
- 2050 cumulative conditions with development under the Waterfront Plan

The existing plus Waterfront Plan and the two 2050 cumulative scenarios in the SF-CHAMP model incorporate changes in housing units, population and employment that reflect the expected growth under each scenario. The two 2050 cumulative scenarios also include *already planned or reasonably expected* transportation network improvements, including the following projects that would directly affect the waterfront:

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[6] *Travel Model One* is a simulation model of typical weekday travel designed to assist in regional planning activities. Like SF-CHAMP, it is an activity-based model that incorporates regional data concerning anticipated changes in land use and the transportation network.

- The Embarcadero Enhancement Project
- Transit Center District Plan
- Central Subway
- Caltrain/High Speed Rail Downtown San Francisco Extension
- Central SoMa Plan, Third Street Market to Folsom streets
- 22 Fillmore/16th Street Improvement Project
- WETA Ferry Service Expansion (e.g., Mission Bay Ferry Terminal)

A full list of the SF-CHAMP model's transportation network changes and the non-Port jurisdiction land use assumptions for the Waterfront Plan analyses are documented in the SFCTA final technical memorandum titled *Housing Element and Waterfront Plan Transportation Network and Land Use Assumptions*, dated January 12, 2022, and included as **Attachment B.**

1.3 Project Travel Demand by Mode of Travel

The travel demand associated with the subsequent projects planned to occur under the Waterfront Plan includes trips generated by additional employees, residents, and visitors to the area for each of the scenarios described above. The SF-CHAMP model results by scenario at the TAZ level are summarized in **Attachment C.**

Table 2, Summary of Waterfront Area Weekday Daily and AM and PM Peak Hour Travel Demand by Way People Travel – Existing Conditions, summarizes the increase in person trips[7] by travel mode and vehicle trips on a daily basis and during the a.m. and p.m. peak hours generated by the subsequent projects compared to the existing (no project) conditions. **Table 3** presents the subsequent projects' contribution to total daily and a.m. and p.m. peak hour person trips and vehicle trips under 2050 cumulative conditions.

[7] A person trip is a trip made by one person by any means of transportation (auto, transit, walk, etc.).

TABLE 2
SUMMARY OF WATERFRONT AREA WEEKDAY DAILY,
AM AND PM PEAK HOUR TRAVEL DEMAND BY WAY PEOPLE TRAVEL
EXISTING CONDITIONS + EXISTING CONDITIONS WITH PLAN [a]

Analysis Period/ Analysis Scenario	Person Trips by Way of Travel						Vehicle Trips [c]
	Auto	Transit	TNC	Walk	Bike	Total	
Daily							
Existing	72,139	26,063	10,372	19,646	3,602	131,822	142,076
Existing plus Waterfront Plan	96,323	36,700	14,396	27,525	5,014	179,958	179,853
Change from Existing	24,184	10,637	4,024	7,879	1,412	48,136	37,777
Percent change from Existing [b]	*33.5%*	*40.8%*	*38.8%*	*40.1%*	*39.2%*	*36.5%*	*26.6%*
AM Peak Hour							
Existing	4,149	2,164	574	774	227	7,888	6,692
Existing plus Waterfront Plan	5,690	3,137	772	1,069	330	10,998	8,771
Change from Existing [b]	1,541	973	198	295	103	3,110	2,079
Percent change from Existing [b]	*37.1%*	*45.0%*	*34.5%*	*38.1%*	*45.4%*	*39.4%*	*31.1%*
PM Peak Hour							
Existing	5,639	2,352	860	1,225	275	10,351	9,711
Existing plus Waterfront Plan	7,564	3,318	1,206	1,672	421	14,181	12,138
Change from Existing	1,925	966	346	447	146	3,830	2,427
Percent change from Existing	*34.1%*	*41.1%*	*40.2%*	*36.5%*	*53.1%*	*37.0%*	*25.0%*

NOTES:

a. Trips within the 28 TAZs that comprise the waterfront area.

b. Totals may not sum due to rounding. Level of precision based on SF-CHAMP model projections.

c. The estimation of the number of vehicle trips takes into account other ways of travel in addition to those listed under the person trips category (auto and Taxi/TNC). They also include vehicle trips made by visitors, commercial vehicles, buses, and taxis/ride hail vehicles without occupants.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

As shown on **Table 2,** during the weekday a.m. peak hour, the subsequent projects under the Waterfront Plan would generate about 3,110 new person trips, a 39 percent increase in the number of trips generated by land uses in the waterfront area, while during the weekday p.m. peak hour, the Waterfront Plan would generate about 3,830 new person trips, a 37 percent increase from existing conditions. Under existing plus Waterfront Plan conditions, the greatest percentage increase in trips would be by transit, walk and bicycle ways of travel. Vehicle trips would increase by approximately 2,080 vehicle trips during the a.m. peak hour and by 2,430 vehicle trips during the p.m. peak hour, a 31 and 25 percent increase from existing conditions, respectively.

TABLE 3
SUMMARY OF WATERFRONT AREA WEEKDAY DAILY,
AM AND PM PEAK HOUR TRAVEL DEMAND BY WAY PEOPLE TRAVEL
2050 CUMULATIVE CONDITIONS [a]

Analysis Period/ Analysis Scenario	Person Trips by Way of Travel						Vehicle Trips [c]
	Auto	Transit	TNC	Walk	Bike	Total	
Daily							
2050 cumulative plus Waterfront Plan	151,135	68,135	31,159	49,887	9,193	309,509	246,303
Waterfront Plan contribution	23,372	11,951	7,146	8,095	1,356	51,920	38,076
Percent contribution of Waterfront Plan [b]	*15.5%*	*17.5%*	*22.9%*	*16.2%*	*14.8%*	*16.8%*	*15.5%*
AM Peak Hour							
2050 cumulative plus Waterfront Plan	8,896	5,618	1,704	2,026	592	18,836	12,400
Waterfront Plan contribution	1,420	1,054	418	296	54	3,242	2,003
Percent contribution of Waterfront Plan [b]	*16.0%*	*18.8%*	*24.5%*	*14.6%*	*9.1%*	*17.2%*	*16.2%*
PM Peak Hour							
2050 cumulative plus Waterfront Plan	11,232	5,925	2,533	3,162	752	23,604	16,262
Waterfront Plan contribution	1,869	1,045	549	462	127	4,052	2,422
Percent contribution of Waterfront Plan [b]	*16.6%*	*17.6%*	*21.7%*	*14.6%*	*16.9%*	*17.2%*	*14.9%*

NOTES:

a. Trips within the 28 TAZs that comprise the waterfront area.

b. The Waterfront Plan Update contribution is the net change between 2050 no project and 2050 plus Waterfront Plan Update conditions. These numbers are similar but not exactly the same as those presented in Table 2 as "Change from Existing Conditions" under each travel category. The differences between the two, which can increase or decrease, is a reflection on changes in trip generation, way of travel, and average vehicle occupancy between Existing and 2050 Cumulative Conditions, as estimated by the SF-CHAMP model.

c. The estimation of the number of vehicle trips takes into account other ways of travel, in addition to those listed under the person trips category (auto and Taxi/TNC). They also include vehicle trips made by visitors, commercial vehicles, buses, taxis and hail-ride vehicles without occupants.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

As shown on **Table 3**, Summary of Waterfront Area Weekday Daily and AM and PM Peak Hour Travel Demand by Way People Travel – 2050 Cumulative Conditions, the travel demand generated by subsequent projects under the Waterfront Plan under 2050 cumulative conditions would be similar to that presented in **Table 2** for existing plus Waterfront Plan conditions. The minor differences in the number of Waterfront Plan trips reflect the model's reassessment of trip generation and mode of travel due to cumulative changes in land uses within the waterfront TAZs and elsewhere in the city, as well as transportation network changes assumed under 2050 cumulative conditions. Under 2050 cumulative conditions, the new person and vehicle trips generated by the Waterfront Plan would represent a contribution of between 15 and 17 percent to total person and vehicle trips within the 28 waterfront TAZs.

Table 4, Weekday AM and PM Peak Hour Travel Demand Growth by Way People Travel by Waterfront Subarea, presents the increase in weekday a.m. and p.m. peak hour person and vehicle trips generated by the subsequent projects under the Waterfront Plan (as presented above in **Table** 2 for existing plus Waterfront Plan conditions) by subarea. As shown on Table 4, the greatest

increase in trips by all travel modes would be within the South Beach/China Basin and the Northeast Waterfront/Ferry Building subareas. As shown on **Table 4** and similar to existing conditions, vehicle trips and person trips by for all ways of travel due to the Waterfront Plan would be greater during the weekday p.m. peak hour than during the a.m. peak hour.[8]

TABLE 4
WEEKDAY AM AND PM PEAK HOUR TRAVEL DEMAND GROWTH
BY WAY PEOPLE TRAVEL BY WATERFRONT SUBAREA [a]

Analysis Period/ Waterfront Subarea	Person Trips by Way of Travel						Vehicle Trips [b]
	Auto	Transit	TNC	Walk	Bike	Total	
AM Peak Hour							
Fisherman's Wharf	45	35	-6	17	8	99	49
Northeast Waterfront/Ferry	474	309	72	117	29	1,001	652
South Beach/China Basin	940	610	128	156	60	1,894	1,228
Mission Bay	-12	-12	1	-10	1	-32	10
Southern Waterfront	94	31	3	15	5	148	140
Total Plan Growth	1,541	973	198	295	103	3,110	2,079
PM Peak Hour							
Fisherman's Wharf	22	42	-1	-5	16	74	31
Northeast Waterfront/Ferry	567	318	128	141	46	1,200	761
South Beach/China Basin	1,246	576	212	289	70	2,393	1,474
Mission Bay	11	-1	-5	-6	-1	-2	3
Southern Waterfront	79	31	12	28	15	165	158
Total Plan Growth	1,925	966	346	447	146	3,830	2,427

NOTE:

a. Totals may not sum due to rounding.

b. The estimation of the number of vehicle trips takes into account other ways of travel, in addition to those listed under the person trips category. They include vehicle trips made by visitors, commercial vehicles, buses, taxis and hail-ride vehicles without occupants.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

Table 5, Weekday AM and PM Peak Hour Ways People Travel by Waterfront Subarea for Existing and 2050 Cumulative Conditions, presents the percent distribution of total person trips within the five subareas by ways of travel for the weekday a.m. and p.m. peak hours for existing, existing plus Waterfront Plan, and 2050 cumulative conditions. As shown on **Table 5,** implementation of the Waterfront Plan would result in very minimal changes in ways people travel from existing

[8] As confirmed by the SF-CHAMP data analysis, an impact analysis of p.m. peak hour conditions would represent a conservative assessment of potential project impacts on the transportation network.

conditions. During the a.m. peak hour, the proportion of trips by auto would decrease by 1 percentage point while trips by transit would increase by 1 percentage point, and trips by TNC, walking and bicycling would remain unchanged. Similarly, during the weekday p.m. peak hour, the proportion of trips by auto would decrease by 1 percentage point while trips by TNC would decrease by 1 percentage point, and trips by transit, walking and bicycling would remain the same as under existing conditions. Under 2050 cumulative conditions during both the weekday a.m. and p.m. peak hours, the proportion of trips by auto and TNC would decrease from existing conditions, and trips by transit and walking would increase from existing conditions.

TABLE 5
WEEKDAY AM AND PM PEAK HOUR WAYS PEOPLE TRAVEL BY WATERFRONT SUBAREA FOR EXISTING AND 2050 CUMULATIVE CONDITIONS [a]

Analysis Period/ Way of Travel	Existing Conditions		2050 Cumulative Conditions
	Existing (No Project)	Existing plus Project	
AM Peak Hour			
Auto	53%	52%	47%
Transit	27%	29%	30%
TNC	7%	7%	9%
Walk	10%	10%	11%
Bike	3%	3%	3%
Total	**100%**	**100%**	**100%**
PM Peak Hour			
Auto	54%	53%	48%
Transit	23%	23%	25%
TNC	8%	9%	11%
Walk	12%	12%	13%
Bike	3%	3%	3%
Total	**100%**	**100%**	**100%**

NOTE:

a. Totals may not sum due to rounding.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

Table 6, Summary of Weekday PM Peak Hour Distribution of New Transit and Vehicle Trips by District and Subarea, presents the distribution of the new weekday p.m. peak hour transit and vehicle trips to the various districts of origin or destination for each of the five waterfront subareas. The majority of new trips generated by subsequent projects under the Waterfront Plan would occur within San Francisco. As shown on **Table 6,** the transit trips would be distributed among all subareas, with the overall greatest proportion of them occurring to/from the East Bay, the South Bay and the Mission/Potrero neighborhoods. The areas with the highest proportion of vehicle trips would be downtown, South of Market, and the East Bay.

TABLE 6
SUMMARY OF WEEKDAY PM PEAK HOUR DISTRIBUTION OF NEW TRANSIT AND VEHICLE TRIPS BY DISTRICT AND SUBAREA [a]

Origin/ Destination District	New Transit Trips						New Vehicle Trips					
	Waterfront Subarea					Water front Plan	Waterfront Subarea					Water front Plan
	Fisher -man's Wharf	North- east Water- front	South Beach	Missio n Bay [b]	South ern Water -front		Fisher -man's Wharf	North- east Water- front	South Beach	Mission Bay [b]	South ern Water -front	
Downtown	-17%	7%	10%	333%	31%	8%	8%	19%	17%	-13%	9%	17%
SoMa	-4%	5%	6%	-400%	5%	6%	25%	9%	16%	-49%	12%	14%
North Beach/ Chinatown	25%	11%	6%	-100%	-2%	8%	50%	17%	8%	-39%	5%	11%
Western Market	-4%	4%	5%	-167%	0%	4%	16%	5%	4%	-32%	1%	4%
Mission/Potrero	20%	12%	10%	267%	-1%	11%	5%	5%	9%	238%	20%	9%
Noe Valley/Glen Park/Bernal Heights	2%	1%	2%	0%	4%	2%	10%	1%	2%	31%	2%	2%
Marina/Pacific Heights	10%	5%	2%	-33%	-2%	3%	-10%	8%	4%	-36%	0%	5%
Richmond	-3%	4%	3%	-33%	9%	3%	-19%	3%	2%	-39%	0%	2%
Bayshore	-2%	2%	4%	200%	8%	3%	-18%	3%	5%	58%	11%	4%
Outer Mission	-5%	2%	3%	167%	-6%	2%	-2%	2%	3%	-73%	6%	2%
Hill Districts	-6%	2%	2%	67%	-3%	1%	4%	1%	1%	26%	-1%	1%
Sunset	10%	3%	3%	0%	2%	3%	23%	2%	3%	-52%	1%	3%
South Bay	13%	6%	11%	-167%	29%	10%	-22%	7%	10%	58%	20%	10%
East Bay	55%	32%	32%	0%	28%	33%	18%	12%	12%	15%	8%	12%
North Bay	6%	4%	1%	-33%	-1%	2%	13%	5%	2%	4%	4%	3%
Outside SF Bay Area							0%	2%	1%	1%	1%	1%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

NOTES:

a. Percentages for all origins/destinations may not sum due to rounding; negative percentages indicate a reduction in the number of trips originating or destined to a particular district.

b. The higher positive and negative percentage values shown in the Mission Bay subarea are due to the low total number (less than five) of vehicle and transit trips generated during the p.m. peak hour

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

1.4 Vehicle Miles Traveled per Capita

The SF-CHAMP model output of vehicle miles traveled for the TAZs within the waterfront area were used to develop average daily VMT per capita for the five subareas. The San Francisco County Transportation Authority's San Francisco Chained Activity Modeling Process (SF-CHAMP) travel demand model is used to estimate existing and future year average daily VMT per capita for residential, office,[9] and retail land use types for the transportation analysis zones in the city.

The model can be used to estimate daily typical weekday VMT for residential, office, and retail land use types. For residential and office uses, the transportation authority uses tour-based analysis, which examines the entire chain of trips over the course of a day, not just trips to and from a site. Tour-based analysis is appropriate in these cases because home and work are "anchor" locations that condition how people structure their travel, like where they might stop for coffee, or whether they choose to leave home by transit or in a car. For retail uses, the transportation authority uses trip-based analysis. A trip-based analysis counts VMT from individual trips to and from a site (as opposed to the entire chain of trips). A trip-based approach is appropriate for retail sites as retail trips are more easily substituted for another location or at another time within a person's schedule than home- and work-related trips. In other words, retail sites are more likely to be chosen for their proximity and convenience to work and home.

Table 7, Average Daily VMT Per Capita by Land Use and Subarea, presents the daily VMT per capita for existing conditions without and with the subsequent projects under the Waterfront Plan and for 2050 cumulative conditions (including the plan) for the three land use types. The regional, citywide, and subarea TAZ values were calculated by dividing the "raw" VMT output from SF-CHAMP by the number of *residents, workers or retail visitors* to obtain the VMT per capita for these land uses.

[9] Office is also used in the VMT analysis as a proxy for the Production Distribution and Repair (PDR), other port-specific and maritime uses in the study area.

TABLE 7
SUMMARY OF AVERAGE DAILY VMT PER CAPITA BY LAND USE AND SUBAREA [b]

Waterfront Subarea	Existing			Existing plus Waterfront Plan			2050 Cumulative plus Waterfront Plan		
	Residential	Office [a]	Retail	Residential	Office [a]	Retail	Residential	Office [a]	Retail
Fisherman's Wharf	5.7	18.1	2.3	5.6	17.5	2.3	5.9	16.5	2.6
Northeast Waterfront/Ferry Building	6.2	15.0	4.6	6.6	15.8	4.6	6.7	13.8	5.0
South Beach/China Basin	7.5	13.0	2.3	8.2	14.7	3.0	9.3	12.9	3.5
Mission Bay	2.6 [c]	19.5	6.6	2.6	20.5	6.3	8.0	14.8	12.4
Southern Waterfront	8.2	*22.8*	8.2	8.2	*21.9*	8.1	6.1	16.4	7.9
Waterfront Area	**6.8**	**16.6**	**3.5**	**7.2**	**16.5**	**3.7**	**6.6**	**14.6**	**4.8**
All of San Francisco	8.6	14.1	6.8	8.4	14.0	6.7	8.5	12.7	7.5
San Francisco Bay Area	18.6	25.7	14.9	18.4	25.5	14.8	17.1	23.8	15.6
San Francisco Bay Area minus 15%[b]	**15.8**	**21.9**	**12.7**	**15.7**	**21.6**	**12.6**	**14.5**	**20.2**	**13.3**

NOTES:

a. Office is also used in the VMT analysis as a proxy for the Production Distribution and Repair (PDR), other port-specific and maritime uses in the study area.

b. Screening criterion. Numbers shown in *underlined italics* indicate values above the criterion.

c. Based on Existing plus Waterfront Plan conditions, as no existing residential units are reported by the SF-CHAMP model within the Mission Bay Waterfront Plan subarea (i.e. TAZs 649, 650 and 655). There are approximately 430 existing residential units in TAZ 650, and the Waterfront Plan does not propose any changes to the number of residential units in the Mission Bay subarea.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

As shown in the table, the average daily VMT per capita is generally higher in those areas where the availability public transit is more limited, such as in the Southern Waterfront subarea. The relatively low average daily VMT per capita values shown in the table for retail trips in the Fisherman's Wharf and South Beach subareas (2.3 vehicle miles per capita) likely reflect that retail is not a primary purpose for travel to those locations, rather it is linked to a different principal trip purpose such as recreational or work travel.

All the VMT per capita values in all the subareas for all the land uses and scenarios would be below their respective planning department screening criterion (average for the entire San Francisco Bay Area minus 15 percent), except for the office land uses in the Southern Waterfront subarea. Under the existing and existing plus Waterfront Plan conditions, the daily VMT per capita for the office land use (which also represents PDR and other port-specific maritime uses) would be above the established criterion; this condition would not occur for the 2050 cumulative condition with the Plan. A summary of the average daily VMT per capita by land use for the individual TAZs from the "weighted" [10] SF-CHAMP model output files is presented in **Attachment D.**

1.5 Roadway Segment Traffic Volumes

Roadway segment link volumes at 15 study locations (three locations within each subarea) were developed for the weekday p.m. peak hour for existing plus Waterfront Plan and 2050 cumulative conditions. The roadways segments were selected as they represent roadways expected to be most affected by vehicle traffic changes due to subsequent projects planned to occur under the Waterfront Plan, and locations where the consultant acquired vehicle count data from prior to the atypical conditions during the COVID-19 pandemic (e.g., prior to reduction in transit service and peak period travel by all modes).[11]

The existing p.m. peak hour vehicular volumes used the prior vehicle counts at each of the study roadway segments by direction (i.e., northbound, southbound, eastbound or westbound).

The existing plus Waterfront Plan p.m. peak hour vehicular volumes for the study roadway segments were estimated using a two-step process:

[10] The raw VMT per capita number generated by the SF-CHAMP model for a given TAZ is averaged out with those from the neighboring TAZs to eliminate sharp jumps in value in the same geographic area.

[11] Weekday p.m. peak hour traffic volumes were obtained from multiple sources approved by the Department, and mostly include counts collected from 2017 through 2019; the count on Third Street between Terry A. Francois Boulevard and Channel Street in the Mission Bay area is from 2015.

1) subtracting the number of p.m. peak hour vehicles on study roadways identified in the SF-CHAMP model outputs for existing conditions from the SF-CHAMP model outputs for existing plus Waterfront Plan conditions; and

2) adding the results of step 1 to the existing vehicular volumes data collected in the field.

Weekday p.m. peak hour volumes for 2050 cumulative conditions were developed using a similar two-step process, except that in step 1 the number of p.m. peak hour vehicles in the SF-CHAMP model outputs for existing conditions were subtracted from the SF-CHAMP model outputs for 2050 cumulative conditions (which includes Waterfront Plan's subsequent projects). In the second step, the results of step 1 were added to the existing traffic volume data collected in the field, in order to estimate 2050 cumulative traffic conditions.

Table 8, Weekday PM Peak Hour Link Volumes by Subarea, presents the weekday p.m. peak hour volumes for existing, existing plus Waterfront Plan, and 2050 cumulative conditions at the 16 study locations.

TABLE 8

WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES BY SUBAREA

Waterfront Subarea/ Segment Location	Existing			Existing plus Waterfront Plan				2050 Cumulative Conditions with Plan				
	NB/EB	SB/WB	Total 2-way	NB/EB	SB/WB	Total 2-way	Growth [a]	NB/EB	SB/WB	Total 2-way	Growth [a]	Project Contrib.
Fisherman's Wharf												
North Point St bet. Powell – Stockton	317	231	548	318	271	589	7%	369	319	688	26%	6%
Bay St bet. The Embarcadero – Kearny	416	878	1,294	486	992	1,478	14%	609	1,044	1,653	28%	11%
The Embarcadero bet. Beach – N. Point	290	306	596	321	344	665	12%	311	319	630	6%	11%
Northeast Waterfront/Ferry Building												
The Embarcadero bet. Green – Vallejo	948	630	1,578	1,045	764	1,809	15%	1,044	813	1,857	18%	12%
The Embarcadero bet. Broadway - Wash	1,268	833	2,101	1,420	981	2,401	14%	1,299	1,130	2,429	16%	12%
Mission St bet. The Embarcadero - Steuart	187	146	333	202	159	361	8%	134	215	349	5%	8%
South Beach/China Basin												
The Embarcadero bet. Harrison - Bryant	868	889	1,757	1,041	966	2,007	14%	1,269	999	2,268	29%	11%
Bryant St bet. The Embarcadero – Main	412	231	643	565	428	993	54%	842	577	1,419	121%	25%
Townsend St bet. Second – Third	403	360	763	504	486	990	30%	705	679	1,384	81%	16%
Townsend St bet. Third – Fourth	507	338	845	533	472	1,005	19%	464	723	1,187	40%	13%
King St bet. Second – Third	1,005	1,080	2,085	1,055	1,260	2,315	11%	1,304	1,639	2,943	41%	8%
Mission Bay												
Third St bet. TFB – Channel	918	173	1,091	1,033	323	1,356	24%	1,362	661	2,023	85%	13%
Third St bet. Warriors Way – 16th	1,029	771	1,800	1,138	966	2,104	17%	1,488	1,503	2,991	66%	10%
Third St bet. 16th – Mariposa	1,025	816	1,841	1,115	1,009	2,124	15%	1,325	1,354	2,679	46%	11%
Southern Waterfront												
Third St bet. 26th - C. Chavez	721	950	1,671	848	1,049	1,897	14%	1,194	1,846	3,040	82%	7%
Third St bet. Cargo Way – Burke	753	610	1,363	833	650	1,483	9%	983	922	1,905	40%	6%
Cargo Way bet. Illinois - Mendell	84	129	213	159	166	325	53%	231	198	429	101%	26%

NOTE:

a. Total two-way traffic volume growth over existing conditions.

SOURCES: San Francisco County Transportation Authority; Adavant Consulting/LCW Consulting, 2021.

Total two-way expected traffic growth over existing conditions due to the Waterfront Plan would generally be between 8 and 24 percent. A couple of locations near major planned developments (i.e., Bryant Street near Piers 30/32 and Cargo Way near Piers 92/94) would experience larger increases, about 50 percent, compared to existing conditions due to substantial development activity expected in close proximity at these two locations under the Plan.

Under 2050 cumulative conditions, traffic volumes at study locations would generally increase between existing and 2050 cumulative conditions by between 60 and 100 percent, with traffic volumes at a few locations in the Southern Waterfront, South Beach/China Basin, and Mission Bay increasing by about 150 to 200 percent due to concentrated development activity (e.g., Piers 90-92 Backlands, Piers 30-32 and Mission Rock). The proposed project contribution to the cumulative traffic volumes would generally be between 5 and 10 percent, increasing at a couple of locations to 16 percent (Southern Waterfront) or 18 percent (South Beach/China Basin).

ATTACHMENT A

SF-CHAMP MODEL WATERFRONT LAND USE INPUTS BY TAZ

PORT JURISDICTION

San Francisco Waterfront Land Use Plan

Port Jurisdiction - Land Use Data

Location / Subarea / TAZ	Waterfront Land Use Plan							
	Total	Employment						
	D.U.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Total Port Jurisdiction	255	1,754	0	11,567	370	654	452	14,796
		12%	*0%*	*78%*	*3%*	*4%*	*3%*	*100%*
Fisherman's Wharf								
847	0	0	0	0	0	0	0	0
851	0	38	0	329	5	0	0	372
853	0	0	0	0	0	0	0	0
855	0	0	0	0	0	0	0	0
Total	0	38	0	329	5	0	0	372
NE Waterfront / Ferry Bldg.								
778	0	0	0	0	0	0	0	0
808	0	0	0	3	-2	36	0	36
814	0	0	0	0	0	0	0	0
828	0	116	0	1,091	0	45	0	1,253
829	0	0	0	0	0	0	0	0
830	0	0	0	573	0	131	0	704
835	0	0	0	0	0	0	0	0
854	0	257	0	2,417	-62	125	0	2,738
958	0	0	0	0	0	0	0	0
Total	0	374	0	4,084	-64	337	0	4,731
South Beach / China Basin								
633	0	0	0	0	0	0	0	0
723	255	1,263	0	5,858	-16	284	452	7,841
725	0	0	0	0	0	0	0	0
762	0	0	0	0	0	0	0	0
763	0	0	0	0	0	0	0	0
926	0	79	0	743	4	33	0	860
Total	255	1,342	0	6,601	-12	317	452	8,701
Mission Bay								
649	0	0	0	0	0	0	0	0
650	0	0	0	0	0	0	0	0
655	0	0	0	-25	70	0	0	45
Total	0	0	0	-25	70	0	0	45
Southern Waterfront								
444	0	0	0	0	84	0	0	84
492	0	0	0	0	0	0	0	0
493	0	0	0	-40	214	0	0	175
521	0	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0
559	0	0	0	617	72	0	0	689
Total	0	0	0	577	371	0	0	948

San Francisco Waterfront Land Use Plan

Port Jurisdiction - Land Use Data

Location / Subarea / TAZ	Year 2020							
	Total D.U.	Employment						
		CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Total Port Jurisdiction	410	9	0	3,617	2,794	6,488	0	12,908
		0%	*0%*	*28%*	*22%*	*50%*	*0%*	*100%*
Fisherman's Wharf								
847	0	0	0	0	34	141	0	175
851	0	2	0	31	413	413	0	859
853	0	0	0	0	53	29	0	81
855	0	0	0	0	1	3,534	0	3,535
Total	0	2	0	31	501	4,116	0	4,651
NE Waterfront / Ferry Bldg.								
778	0	0	0	0	0	26	0	26
808	0	0	0	588	2	99	0	689
814	0	0	0	0	0	0	0	0
828	0	0	0	421	301	17	0	739
829	0	0	0	272	0	16	0	287
830	125	0	0	0	0	25	0	25
835	0	0	0	639	0	0	0	639
854	0	0	0	50	125	23	0	198
958	0	0	0	532	0	201	0	733
Total	125	0	0	2,502	428	407	0	3,337
South Beach / China Basin								
633	108	0	0	126	0	0	0	126
723	0	0	0	237	97	14	0	348
725	177	0	0	0	0	1,265	0	1,265
762	0	0	0	0	3	0	0	3
763	0	0	0	0	27	57	0	84
926	0	0	0	11	22	10	0	44
Total	285	0	0	374	149	1,347	0	1,869
Mission Bay								
649	0	7	0	28	30	9	0	73
650	0	0	0	49	0	0	0	50
655	0	0	0	55	529	29	0	613
Total	0	7	0	133	558	38	0	736
Southern Waterfront								
444	0	0	0	22	142	51	0	215
492	0	0	0	96	411	33	0	541
493	0	0	0	40	432	0	0	472
521	0	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0
559	0	0	0	418	173	496	0	1,088
Total	0	0	0	577	1,158	580	0	2,315

San Francisco Waterfront Land Use Plan

Port Jurisdiction - Land Use Data

Location / Subarea / TAZ	Year 2020 with Plan							
	Total D.U.	Employment						
		CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Total Port Jurisdiction	665	1,763	0	15,183	3,164	7,142	452	27,704
		6%	*0%*	*55%*	*11%*	*26%*	*2%*	*100%*
Fisherman's Wharf								
847	0	0	0	0	34	141	0	175
851	0	40	0	360	418	413	0	1,231
853	0	0	0	0	53	29	0	81
855	0	0	0	0	1	3,534	0	3,535
Total	0	40	0	360	506	4,116	0	5,023
NE Waterfront / Ferry Bldg.								
778	0	0	0	0	0	26	0	26
808	0	0	0	591	0	135	0	726
814	0	0	0	0	0	0	0	0
828	0	116	0	1,512	301	62	0	1,992
829	0	0	0	272	0	16	0	287
830	125	0	0	573	0	156	0	729
835	0	0	0	639	0	0	0	639
854	0	257	0	2,467	63	148	0	2,935
958	0	0	0	532	0	201	0	733
Total	125	374	0	6,587	364	743	0	8,068
South Beach / China Basin								
633	108	0	0	126	0	0	0	126
723	255	1,263	0	6,095	81	298	452	8,189
725	177	0	0	0	0	1,265	0	1,265
762	0	0	0	0	3	0	0	3
763	0	0	0	0	27	57	0	84
926	0	79	0	754	26	44	0	903
Total	540	1,342	0	6,975	137	1,664	452	10,570
Mission Bay								
649	0	7	0	28	30	9	0	73
650	0	0	0	49	0	0	0	50
655	0	0	0	31	598	29	0	658
Total	0	7	0	108	628	38	0	781
Southern Waterfront								
444	0	0	0	22	226	51	0	299
492	0	0	0	96	411	33	0	541
493	0	0	0	0	646	0	0	646
521	0	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0
559	0	0	0	1,035	246	496	0	1,777
Total	0	0	0	1,153	1,529	580	0	3,263

San Francisco Waterfront Land Use Plan

Port Jurisdiction - Land Use Data

Location / Subarea / TAZ	Year 2050 No Plan							
	Total D.U.	Employment						
		CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Total Port Jurisdiction	6,688	368	0	17,379	2,886	6,921	817	28,371
		1%	*0%*	*61%*	*10%*	*24%*	*3%*	*100%*
Fisherman's Wharf								
847	0	0	0	0	34	141	0	175
851	0	2	0	31	413	413	0	859
853	0	0	0	0	53	0	0	53
855	0	0	0	0	1	3,534	0	3,535
Total	0	2	0	31	501	4,088	0	4,622
NE Waterfront / Ferry Bldg.								
778	0	0	0	0	0	26	0	26
808	0	0	0	588	2	99	0	689
814	0	0	0	0	0	0	0	0
828	0	0	0	421	300	17	0	738
829	0	0	0	272	0	16	0	287
830	125	0	0	0	0	109	268	378
835	0	0	0	639	0	0	0	639
854	0	0	0	50	125	93	0	267
958	0	0	0	532	0	201	0	733
Total	125	0	0	2,502	426	561	268	3,758
South Beach / China Basin								
633	108	0	0	126	0	0	0	126
723	0	0	0	237	97	14	0	348
725	177	0	0	0	0	1,265	0	1,265
762	0	0	0	0	3	0	0	3
763	0	0	0	0	27	57	0	84
926	0	0	0	11	22	10	0	44
Total	285	0	0	374	149	1,347	0	1,870
Mission Bay								
649	0	7	0	28	30	9	0	73
650	0	0	0	49	0	0	0	50
655	1,327	0	0	5,797	529	29	0	6,354
Total	1,327	7	0	5,874	558	38	0	6,477
Southern Waterfront								
444	0	0	0	22	142	51	0	215
492	0	0	0	96	411	33	0	541
493	0	0	0	40	432	0	0	472
521	262	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0
559	4,689	360	0	8,439	266	803	549	10,417
Total	4,951	360	0	8,597	1,251	887	549	11,644

San Francisco Waterfront Land Use Plan

Port Jurisdiction - Land Use Data

Location / Subarea / TAZ	Year 2050 with Plan							
	Total	Employment						
	D.U.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Total	6,943	2,123	0	28,946	3,255	7,575	1,269	43,168
Port Jurisdiction	*92% #*	*28%*	*0%*	*382%*	*43%*	*545%*		
Fisherman's Wharf								
847	0	0	0	0	34	141	0	175
851	0	40	0	360	418	413	0	1,231
853	0	0	0	0	53	0	0	53
855	0	0	0	0	1	3,534	0	3,535
Total	0	40	0	360	506	4,088	0	4,994
NE Waterfront / Ferry Bldg.								
778	0	0	0	0	0	26	0	26
808	0	0	0	591	0	135	0	726
814	0	0	0	0	0	0	0	0
828	0	116	0	1,512	300	62	0	1,991
829	0	0	0	272	0	16	0	287
830	125	0	0	573	0	240	268	1,082
835	0	0	0	639	0	0	0	639
854	0	257	0	2,467	63	218	0	3,005
958	0	0	0	532	0	201	0	733
Total	125	374	0	6,587	363	898	268	8,489
South Beach / China Basin								
633	108	0	0	126	0	0	0	126
723	255	1,263	0	6,096	81	298	452	8,190
725	177	0	0	0	0	1,265	0	1,265
762	0	0	0	0	3	0	0	3
763	0	0	0	0	27	57	0	84
926	0	79	0	754	26	44	0	903
Total	540	1,342	0	6,976	137	1,664	452	10,571
Mission Bay								
649	0	7	0	28	30	9	0	73
650	0	0	0	49	0	0	0	50
655	1,327	0	0	5,772	598	29	0	6,399
Total	1,327	7	0	5,849	628	38	0	6,522
Southern Waterfront								
444	0	0	0	22	226	51	0	299
492	0	0	0	96	411	33	0	541
493	0	0	0	0	646	0	0	646
521	262	0	0	0	0	0	0	0
522	0	0	0	0	0	0	0	0
559	4,689	360	0	9,056	338	803	549	11,106
Total	4,951	360	0	9,174	1,622	887	549	12,592

WATERFRONT AREA

San Francisco Waterfront Land Use Plan

SF CHAMP Model - Land Use Data

Location / Subarea / TAZ	Year 2020 Baseline								
	Total		Employment						
	D.U.	Popul.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Waterfront Area	1,923	3,331	760	152	10,020	4,062	11,501	831	27,326
Remainder SF	405,121	937,938	76,041	52,359	420,123	67,934	104,905	22,191	743,553
Fisherman's Wharf									
847	0	0	12	0	81	0	184	235	512
851	0	0	2	0	31	413	413	0	859
853	495	889	52	4	275	0	75	6	412
855	0	0	0	0	0	1	3,534	0	3,535
Total	495	889	66	4	387	414	4,206	241	5,318
NE Waterfront / Ferry Bldg.									
778	0	0	320	15	655	0	123	569	1,682
808	0	0	0	0	588	2	99	0	689
814	161	258	41	16	448	3	99	0	607
828	0	0	0	0	421	300	17	0	738
829	355	568	145	34	1,194	5	382	0	1,760
830	125	199	0	0	0	0	25	0	25
835	0	0	0	0	639	0	0	0	639
854	0	0	0	0	50	125	23	0	198
958	0	0	0	0	532	0	201	0	733
Total	641	1,025	506	65	4,527	435	969	569	7,071
South Beach / Chin3asin									
633	108	203	0	0	126	0	0	0	126
723	0	0	0	0	237	97	14	0	348
725	177	292	0	0	0	0	1,265	0	1,265
762	78	128	8	4	724	2	3,076	0	3,814
763	46	77	27	0	2,353	0	725	0	3,105
926	0	0	0	0	11	22	10	0	43
Total	409	700	35	4	3,451	121	5,090	0	8,701
Mission Bay									
649	0	0	7	0	28	30	9	0	74
650	0	4	0	0	49	0	0	0	49
655	0	0	0	0	55	529	29	0	613
Total	0	4	7	0	132	559	38	0	736
Southern Waterfront									
444	0	0	0	0	22	142	51	0	215
492	0	2	0	0	96	411	33	0	540
493	0	0	0	0	40	432	0	0	472
521	377	709	72	18	651	776	508	9	2,034
522	1	2	74	61	296	599	110	12	1,152
559	0	0	0	0	418	173	496	0	1,087
Total	378	713	146	79	1,523	2,533	1,198	21	5,500

San Francisco Waterfront Land Use Plan

SF CHAMP Model - Land Use Data

Location / Subarea / TAZ	Year 2020 with Plan								
	Total		Employment						
	D.U.	Popul.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Waterfront Area	2,178	3,750	2,513	152	21,587	4,432	12,156	1,283	42,123
Remainder SF	405,121	937,938	76,041	52,359	420,123	67,934	104,905	22,191	743,553
Fisherman's Wharf									
847	0	0	12	0	81	0	184	235	512
851	0	0	40	0	360	418	413	0	1,231
853	495	889	52	4	275	0	75	6	412
855	0	0	0	0	0	1	3,534	0	3,535
Total	495	889	104	4	716	419	4,206	241	5,690
NE Waterfront / Ferry Bldg.									
778	0	0	320	15	655	0	123	569	1,682
808	0	0	0	0	591	0	135	0	726
814	161	258	41	16	448	3	99	0	607
828	0	0	116	0	1,512	301	62	0	1,991
829	355	568	145	34	1,194	5	382	0	1,760
830	125	199	0	0	573	0	156	0	729
835	0	0	0	0	639	0	0	0	639
854	0	0	257	0	2,467	63	148	0	2,935
958	0	0	0	0	532	0	201	0	733
Total	641	1,025	879	65	8,611	372	1,306	569	11,802
South Beach / China Basin									
633	108	203	0	0	126	0	0	0	126
723	255	419	1,263	0	6,095	81	298	452	8,189
725	177	292	0	0	0	0	1,265	0	1,265
762	78	128	8	4	724	2	3,076	0	3,814
763	46	77	27	0	2,353	0	725	0	3,105
926	0	0	79	0	754	26	44	0	903
Total	664	1,119	1,377	4	10,052	109	5,408	452	17,402
Mission Bay									
649	0	0	7	0	28	30	9	0	74
650	0	4	0	0	49	0	0	0	49
655	0	0	0	0	31	598	29	0	658
Total	0	4	7	0	108	628	38	0	781
Southern Waterfront									
444	0	0	0	0	22	226	51	0	299
492	0	2	0	0	96	411	33	0	540
493	0	0	0	0	0	646	0	0	646
521	377	709	72	18	651	776	508	9	2,034
522	1	2	74	61	296	599	110	12	1,152
559	0	0	0	0	1,035	246	496	0	1,777
Total	378	713	146	79	2,100	2,904	1,198	21	6,448

San Francisco Waterfront Land Use Plan

SF CHAMP Model - Land Use Data

Location / Subarea / TAZ	Year 2050 Baseline								
	Total		Employment						
	D.U.	Popul.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Waterfront Area	10,094	22,651	1,668	1,185	25,945	3,458	12,539	1,643	46,438
Remainder SF	498,650	1,162,826	88,510	66,757	473,375	71,240	111,357	23,868	835,107
Fisherman's Wharf									
847	5	12	12	0	49	0	184	235	480
851	0	0	2	0	31	413	413	0	859
853	495	889	79	33	309	0	99	5	525
855	0	0	0	0	0	1	3,534	0	3,535
Total	500	901	93	33	389	414	4,230	240	5,399
NE Waterfront / Ferry Bldg.									
778	11	26	330	15	608	0	123	569	1,645
808	0	0	0	0	588	2	99	0	689
814	165	268	70	18	457	3	139	0	687
828	0	0	0	0	421	300	17	0	738
829	370	603	148	35	1,192	5	385	0	1,765
830	125	199	0	0	0	0	109	268	377
835	0	0	0	0	639	0	0	0	639
854	0	0	0	0	50	125	93	0	268
958	0	0	0	0	532	0	201	0	733
Total	671	1,096	548	68	4,487	435	1,166	837	7,541
South Beach / China Basin									
633	108	203	0	0	126	0	0	0	126
723	0	27	0	0	237	97	14	0	348
725	177	292	0	0	0	0	1,265	0	1,265
762	253	542	8	19	580	2	3,085	0	3,694
763	132	280	27	0	2,456	0	725	0	3,208
926	0	0	0	0	11	22	10	0	43
Total	670	1,344	35	19	3,410	121	5,099	0	8,684
Mission Bay									
649	0	0	7	0	28	30	9	0	74
650	0	4	0	0	49	0	0	0	49
655	1,327	3,134	0	0	5,797	529	29	0	6,355
Total	1,327	3,138	7	0	5,874	559	38	0	6,478
Southern Waterfront									
444	0	0	0	0	22	142	51	0	215
492	0	2	0	0	96	411	33	0	540
493	0	0	0	0	40	432	0	0	472
521	2,236	5,100	549	1,001	2,969	0	1,008	5	5,532
522	1	4	76	64	219	678	111	12	1,160
559	4,689	11,066	360	0	8,439	266	803	549	10,417
Total	6,926	16,172	985	1,065	11,785	1,929	2,006	566	18,336

San Francisco Waterfront Land Use Plan

SF CHAMP Model - Land Use Data

Location / Subarea / TAZ	Year 2050 with Plan								
	Total		Employment						
	D.U.	Popul.	CIE	Medical	MIPS	PDR	Retail	Visitor	Total
Waterfront Area	10,349	23,082	3,421	1,185	37,511	3,827	13,194	2,095	61,233
Remainder SF	498,650	1,162,826	88,510	66,757	473,375	71,240	111,357	23,868	835,107
Fisherman's Wharf									
847	5	12	12	0	49	0	184	235	480
851	0	0	40	0	360	418	413	0	1,231
853	495	889	79	33	309	0	99	5	525
855	0	0	0	0	0	1	3,534	0	3,535
Total	500	901	131	33	718	419	4,230	240	5,771
NE Waterfront / Ferry Bldg.									
778	11	26	330	15	608	0	123	569	1,645
808	0	0	0	0	591	0	135	0	726
814	165	268	70	18	457	3	139	0	687
828	0	0	116	0	1,512	301	62	0	1,991
829	370	603	148	35	1,192	5	385	0	1,765
830	125	199	0	0	573	0	240	268	1,081
835	0	0	0	0	639	0	0	0	639
854	0	0	257	0	2,467	63	218	0	3,005
958	0	0	0	0	532	0	201	0	733
Total	671	1,096	921	68	8,571	372	1,503	837	12,272
South Beach / China Basin									
633	108	203	0	0	126	0	0	0	126
723	255	458	1,263	0	6,095	81	298	452	8,189
725	177	292	0	0	0	0	1,265	0	1,265
762	253	542	8	19	580	2	3,085	0	3,694
763	132	280	27	0	2,456	0	725	0	3,208
926	0	0	79	0	754	26	44	0	903
Total	925	1,775	1,377	19	10,011	109	5,417	452	17,385
Mission Bay									
649	0	0	7	0	28	30	9	0	74
650	0	4	0	0	49	0	0	0	49
655	1,327	3,134	0	0	5,772	598	29	0	6,399
Total	1,327	3,138	7	0	5,849	628	38	0	6,522
Southern Waterfront									
444	0	0	0	0	22	226	51	0	299
492	0	2	0	0	96	411	33	0	540
493	0	0	0	0	0	646	0	0	646
521	2,236	5,100	549	1,001	2,969	0	1,008	5	5,532
522	1	4	76	64	219	678	111	12	1,160
559	4,689	11,066	360	0	9,056	338	803	549	11,106
Total	6,926	16,172	985	1,065	12,362	2,299	2,006	566	19,283

ATTACHMENT B

HOUSING ELEMENT AND WATERFRONT PLAN TRANSPORTATION NETWORK AND LAND USE ASSUMPTIONS, SFCTA JANUARY 2022

Housing Element and Waterfront Plan

Transportation Network and Land Use Assumptions

Prepared by the San Francisco County Transportation Authority

January 12, 2022

1. INTRODUCTION

This memo describes year 2020, 2035, and 2050 transportation network and land use assumptions for Housing Element and Waterfront Plan analysis. The 2020 base year represents late January 2020, including recent projects like Better Market Street and several quick-build bicycle safety projects, but prior to the COVID-19 shelter-in-place restrictions and contraction of the economy. The future years 2035 and 2050 each feature a baseline and three Housing Element rezoning scenarios. Years 2020 and 2050 each feature a Waterfront Plan buildout scenario. The scenarios within each year share a common set of network assumptions.

2. CATEGORIES OF ASSUMPTIONS

Four categories of input assumptions are necessary to specify a model scenario. These include:

- **Regional land use assumptions** – Households and jobs by San Francisco Transportation Analysis Zone (TAZ) for the eight Bay Area counties outside of San Francisco. 2050 regional land use assumptions were developed through ConnectSF.
- **San Francisco land use assumptions** – Households and jobs by SF TAZ within San Francisco. The Housing Element team developed baseline land use assuming no change to the existing 2014 housing element, a proposed action, and three alternative rezoning scenarios for 2035 and 2050. The Housing Element team also conducted a Plan Bay Area 2050 model run. The Waterfront Plan team developed intensified land use assumptions for the Waterfront Plan Area, which are applied to create 2020 and 2050 scenarios.
- **Land use adjustment factors** – Values such as household size, household income distributions, age distributions, employed residents to household ratios, that are applied to household and job assumptions to develop complete land use assumptions. These assumptions are inherited from Plan Bay Area 2040 regional land use forecasts.
- **Transportation network assumptions** – These include roads, tolls, parking costs, transit services, transit fares and related attributes.

3. SCENARIOS

The Housing Element conducted 17 model runs: a baseline for 2020, 2035, and 2050, and for each forecast year (2035 and 2050), five San Francisco zoning scenarios (Eastside Focus "A", Transit Corridor Focus "B", Residential Growth Focus "C", Plan Bay Area 2050 "D", and the "Proposed Action"). The Housing Element team also conducted two scenarios to test the sensitivity of outcomes to the recently-adopted Plan Bay Area 2050 ("D + PBA2050" and "Proposed Action + PBA2050"). The Waterfront Plan will use the same 2020 and 2050 baseline scenarios, and requires two additional model runs: 2020 Waterfront Plan and 2050 Waterfront Plan. The land use assumptions were developed by Planning Department staff with consulting support. There will be one set of transportation networks for each model year shared by all the scenarios for that year. Regional land use assumptions and land use adjustment factors will also be shared by all scenarios for a model year. Scenarios within a common model year will differ solely in the allocation of households and jobs within San Francisco, representing either the baseline or one of three alternative zoning assumptions.

4. SAN FRANCISCO LAND USE ASSUMPTIONS

The San Francisco Planning Department produced 19 land use scenarios for the Housing Element and Waterfront Plan, summarized in Table 1.

Table 1: San Francisco Land Use Assumptions by Housing Element and Waterfront Scenario

Scenario	Households	Population	Jobs	Housing Element	Waterfront Plan
2020 Base	407,044	941,269	770,882	X	X
2020 Waterfront Plan	407,299	941,688	785,678		X
2035 Baseline	462,548	1,074,358	849,053	X	
2035 Scenario A	483,659	1,124,243	849,095	X	
2035 Scenario B	483,628	1,124,241	847,183	X	
2035 Scenario C	483,617	1,124,256	847,254	X	
2035 Scenario D	485,352	1,128,337	798,771	X	
2035 Scenario D + PBA2050 regional	485,352	1,128,337	798,771	X	
2035 Proposed Action	483,606	1,124,243	849,402	X	
2035 Proposed Action + PBA2050 regional	483,606	1,124,243	849,402	X	

2050 Baseline	508,744	1,185,477	881,546	X	X
2050 Scenario A	561,873	1,310,873	889,695	X	
2050 Scenario B	561,893	1,310,873	887,394	X	
2050 Scenario C	561,882	1,310,884	887,386	X	
2050 Scenario D	596,351	1,392,247	888,190	X	
2050 Scenario D + PBA2050 regional	596,351	1,392,247	888,190	X	
2050 Proposed Action	558,617	1,303,171	879,193	X	
2050 Proposed Action + PBA2050 regional	558,617	1,303,171	879,193	X	
2050 Waterfront Plan	508,999	1,185,908	896,343		X

5. REGIONAL LAND USE ASSUMPTIONS

The Metropolitan Transportation Commission (MTC) produces regional land use projections as part of Plan Bay Area. In October 2021, MTC adopted Plan Bay Area 2050, replacing the Plan Bay Area 2040. The development of land use inputs and subsequent modeling of the Housing Element and Waterfront Plan Project scenarios took place under Plan Bay Area 2040. The regional land use assumptions for 2020 and 2035 were prepared by MTC for Plan Bay Area 2040. The regional land use assumptions for 2050 were developed by the ConnectSF team based on continuing 2015-2040 growth trajectories for an additional 10 years beyond 2040. The regional land use is consistent across all scenarios sharing a model year. These land use assumptions are described in Table 2.

Table 2: PBA2040 and ConnectSF Regional Land Use Assumptions by Year

Model Year	Households	Population	Jobs
2020	2,473,369	6,940,868	3,361,936
2035	2,827,365	8,035,115	3,701,762
2050	3,177,664	9,220,906	4,135,229

Due to the adoption of PBA2050, four new scenarios were added, which use land use described in Table 3.

Table 3: PBA2050 Regional Land Use Assumptions by Year

Model Year	Households	Population	Jobs
2035	3,024,502	7,952,227	4,018,977
2050	3,464,942	9,052,596	4,490,258

6. 2050 NETWORK ASSUMPTIONS

Transportation networks for 2020, 2035, and 2050 were developed, based on networks prepared for ConnectSF and further updated with input from SFMTA and Planning Department staff. Transportation network assumptions vary only by year, but are consistent for all scenarios sharing a model year.

Network Development Process

SFTCA developed a draft project list for the Housing Element and Waterfront Plan based on the ConnectSF transportation network assumptions. This formed a draft 2040 transportation project list. Planning Department and SFMTA staff reviewed the draft project list and responded with comments. SFCTA staff incorporated these comments where possible and sought clarification where additional information was needed. Upon clarification from SFMTA and Planning Department staff, SFCTA incorporated remaining updates into final network model assumptions. The resulting 2040 transportation network assumptions are inputs into the 2040 Baseline SF-CHAMP scenario.

Project List

The 2020 base networks represent the end of January 2020, up to and including the implementation of Better Market Street. Table 2 lists San Francisco projects included in the 2035 and 2050 networks and designates in which model years they are included.

Table 1 lists San Francisco transportation projects included in the Housing Element and Waterfront Plan transportation networks, and designates which model years each project is included in. Table 2 shows significant regional transit projects that are represented in the network.

Plan	Project	Description
	2035	
Bike Plan	5th Street Bike Lanes (Bike Plan - Long-Term)	Bike lanes on 5th Street between Market and Townsend
Bike Plan	2nd Street Bike Lanes (Bike Plan)	Bike lanes on 2nd Street between Market and Townsend
Bike Plan	San Bruno Project	New bike lane is added between Mansell and Paul.

	Upper Market Street	Implements a variety of street and circulation changes to the Upper Market Street area included lane changes, turn restrictions, and bicycle facilities
Central SoMa	3rd St (Central SoMa)	3rd from Market St to Townsend St, 3 NB auto lanes, 1 NB bus lane along the east curb, and right turn pockets in some locations, with boarding islands or bus bulbs at transit stops
Central SoMa	4th St (Central SoMa)	4th from Market St to Folsom St, 2 SB auto lanes, 1 bus lane, plus turn lanes. 4th from Harrison St to Townsend, 2 SB auto lanes with bi-directional T-Third right of way in the center
Central SoMa	Folsom Street (Central SoMa - Quick-Build)	Folsom from 2nd St to 11th St, Not technically a Central SoMa Plan project.
Central SoMa	Howard St (Central SoMa - Quick-Build)	Howard from 4th St to 11th St, Not technically a Central SoMa Plan project.
Central SoMa	Folsom Street (Central SoMa - Long-Term)	Folsom from 2nd St to 11th St, during peak: two EB auto lanes, one EB bus lane, and two-way cycle track along north curb; during off-peak: two EB auto lanes, and two-way cycle track along north curb. Cycle track would also extent further east to the Embarcadero. Replacement text from CSoMa Note to File: Folsom Street, between 2nd and 11th streets, would include two eastbound travel lanes from 4th to 10th streets, three eastbound travel lanes from 10th to 11th and 2nd to 4th streets, a two-way cycle track along the southern curb, a transit-only lane from Mabini to 10th streets, new bulb-outs on the north side of the street (east of 8th Street only), turn pockets at intersection approaches, and 10-foot sidewalks on both sides of the street.
Central SoMa	Howard Street (Central SoMa - Long-Term)	Howard from 3rd St to 11th St, during peak: three WB auto lanes, and two-way cycle track along south curb; during off-peak: two WB auto lanes, and two-way cycle track along south curb. Left turn-pockets and left-turn signals created where possible. Replacement Text from CSoMa Note to File: Howard Street, between 4th and 11th streets, would include two westbound travel lanes, a two-way cycle track along the southern curb, new bulb-outs on the north side at all intersections, parking and loading on both sides of Howard Street, turn pockets at intersection approaches, and 12-foot-wide sidewalks on both sides of the street.

Central SoMa	Harrison (Central SoMa)	Harrison from 2nd St to 3rd St, during peak: one WB bus lane, two WB auto lanes, two EB auto lanes; during off-peak: two WB auto lanes, one EB auto lane. Harrison from 3rd St to 6th St, during peak: four WB auto lanes, one WB bus lane; during off-peak: three WB auto lanes. Harrison from 6th St to 10 St, all times: four WB auto lanes, one WB bus lane. Harrison from 10th to 11th St, all times: two WB auto lanes, one WB bus lane, one EB auto lane.
Central SoMa	Bryant (Central SoMa)	Bryant from 2nd to 3rd St, during peak: five EB auto lanes; during off-peak, three EB auto lanes. Bryant from 3rd St to 6th St, during peak: four EB auto lanes, one EB bus lane; during off-peak, 3 EB auto lanes. Bryant from 6th St to 7th St, all times: four EB auto lanes, one EB bus lane.
Central SoMa	Brannan (Central SoMa - Long-Term)	Brannan from 2nd St and 6th St, one EB auto lane and one WB auto lane, one-way buffered cycle tracks in each direction, 100-foot-long right-turn poockets at intersection approaches
Hub Public Realm Plan	13th St (Hub PRP)	Extension of the 13th St protected bike lanes from Folsom to Valencia 13th from Valencia to Otis - 2 WB auto lanes, 2 EB auto lanes One NB US-101 lane to WB 13th, one NB US-101 lane to EB Mission 13th from Otis to S Van Ness - 1 WB auto lane, 2 EB auto lanes to US-101, 1 through EB auto lane 13th from S Van Ness to Folsom - 1 WB right turn lane, 1 WB through lane, 2 WB left turn lanes, 2 EB auto lanes
Hub Public Realm Plan	11th St (Hub PRP)	Protected bikes lanes between Market and Bryant Elimination of center turn lane between Minna and Bryant One NB auto lane, one SB auto lane Turn pockets at some intersections
Hub Public Realm Plan	S Van Ness (Hub PRP)	Lane reconfiguration to redesign street as boulevard between Mission and 13th St 2 NB auto lanes, 2 SB auto lanes 1 NB local traffic auto lane, 1 SB local traffic auto lane

Hub Public Realm Plan	Mission/Otis (Hub PRP)	EB U-turns from Mission to Otis prohibited One WB transit-only lane on Otis Two WB auto lanes on Otis between Gough and S Van Ness Two WB auto left-turn lanes on Otis between Gough and 13th
Civic Center Public Realm Plan	Polk Street (Civic Center PRP)	Protected cycletracks on Polk between McAllister and Grove Polk from McAllister to Grove - Two SB auto lanes, zero NB auto lanes
Civic Center Public Realm Plan	Grove Street (Civic Center PRP)	Protected cycletracks on Grove between Market and Gough Grove from Market to Larkin - one WB auto lane, zero EB auto lanes Grove from Larkin to Polk - closed to autos Grove from Polk to Van Ness - one EB auto lane, zero WB auto lanes Grove from Van Ness to Franklin - one EB auto lane, one EB right-turn only approaching Van Ness, one WB auto lane Grove from Franklin to Gough - one EB auto lane, one EB left-turn lane at Franklin, one WB left-turn only lane at Gough Gough SBRT to Grove prohibited
Muni Forward	14 Mission SoMa Muni Forward	Expand existing part-time transit lanes to 24/7 between Main and 11th streets by remove one lane of parking.
Muni Forward	22 Fillmore: 16th Street Improvement Project (Muni Forward)	Between Church and Bryant streets, create a side running transit-only lane in the westbound direction through lane conversion. Between Bryant and Mississippi streets, create center-lane transit lane in eastbound direction (replaces existing curbside transit lane between Potrero Avenue and Mississippi Street that was added circa 2017). Between Fourth and Third streets, create side running transit-only lane in both directions through lane conversion. Along the length of the corridor, add traffic signals, add left turn restrictions, and add some left turn pockets. Add transit bulbs and transit islands at various locations along the corridor.
6th Street	6th Street (Long-Term)	Between Market Street and Howard Street, convert four travel lanes to two travel lanes; add a new bicycle lane in each direction with sidewalks widened by 3 to 6 feet (3 to 4 feet at block corners and 6 feet along the block). Traffic signal cycle lengths would be increased from 60 to 90 seconds, and the offsets would be adjusted.

7th and 8th Street	7th and 8th Streets Complete Streets (Long-Term)	7th Street: three traffic lanes and class 4 bike lane from Market to Heron in 2020. Extend bike lane and road diet to Townsend in 2040.
Better Market Street	Better Market Street - Transportation Elements	Improve Market Street between Steuart Street and Octavia Boulevard. Includes resurfacing, sidewalk improvements, way-finding, lighting, landscaping, transit boarding islands, transit connections, traffic signals, transportation circulation changes, and utility relocation and upgrade./
19th Avenue	19th Avenue Corridor	Tier 4C projects from the 19th Avenue Corridor Study: · 19th Ave / Holloway Ave – add a fourth southbound lane · 19th Ave / Crespi Dr – fourth southbound lane will be extended and converted into a through-right into Crespi · 19th Ave / Junipero Serra Blvd – add a fourth lane for southbound right-turn onto Junipero Serra
	Annie Street	· The existing mini-plaza at the intersection of Annie St and Market St will be expanded to Stevenson Street · Between Mission Street and Ambrose Bierce Alley, Annie Street would be closed to vehicular traffic and transformed into a new pedestrian plaza · The remainder of Annie St between the two plazas would retain vehicular traffic but be redesigned as a single-surface shared street
Geary BRT	Geary Boulevard Improvement Project (Geary BRT Phase 2)	Implement Geary Bus Rapid Transit (BRT) to improve service between Stanyan St and Point Lobos Avenue. This proposal includes dedicated bus lanes, enhanced platforms, adjustments to local bus stops, turn lane restrictions, new signalization with Transit Signal Priority, real-time arrival information, low-floor buses, and safety improvements in support of Vision Zero. Expansion vehicles are included in RTPID 17-05-0013.
Geneva BRT	Geneva-Harney Bus Rapid Transit	Provides exclusive bus lanes, transit signal priority, and high-quality stations along Geneva Avenue (from Santos St to Executive Park Blvd), Harney Way, and Crisp Avenue, and terminating at the Hunters Point Shipyard Center. The project includes pedestrian and bicycle improvements in support of Vision Zero and connects with Muni Forward transit priority improvements west of Santos Street. This is the near-term alternative that does not rely on the full extension of Harney Way across US 101.
CPHPS	Candlestick Point Local Roads Phase 1	Build new local streets within the Hunters Point Shipyard and Candlestick Point area.
Mission Bay	Mariposa Ramp, Mission Bay	Increase Hwy 101 offramp to Mariposa from 1 to 2 lanes.
Parkmerced	Parkmerced Transportation Improvements	Implements transportation improvements for the Parkmerced development including enhanced transit service, pedestrian and bicycle facilities, intersection improvements, parking management, carshare and bikehare stations

CPHPS	Southeast Waterfront Transportation Improvements - Phase 1 (Candlestick express bus, 56 extension into Candlestick, dedicated bike lanes)	Create a 5 mile multi-modal corridor of streets, transit facilities, pedestrian paths, and dedicated bicycle lanes to link the Candlestick project area to BART, T-Third light rail, Caltrain, local bus lines and future ferry service. A BRT system (included in a RTPID 17-05-0032) would use exclusive transit right-of-way, station and shelter facilities, and transit signal priority infrastructure. This project also includes express bus and enhances transit service between the Southeast Waterfront and downtown San Francisco. Candlestick express bus and 56 extension into Candlestick, dedicated bike lanes, will be functional as of 2035. This includes portion within Candlestick only. Hunters Point Shipyard will not be done by 2035. Parts of BRT right of way will be constructed by 2035, but entire Geneva-Harney BRT will not be in place by 2035.
Treasure Island	Treasure Island Mobility Management Program: Intermodal Terminal, Congestion Toll, Transit Service, Transit Capital	New ferry service between San Francisco and Treasure Island; AC Transit service between Treasure Island and Oakland; shuttle service on-Island; bike share on-Island; priced-managed parking on-Island; Travel Demand Management program.
Central Subway	T-Third Phase II: Central Subway	Extends the Third Street Light Rail line north from King Street along Third Street, entering a new Central Subway near Bryant Street and running under Geary and Stockton Streets to Stockton & Clay Streets in Chinatown. New underground stations will be located at Moscone Center, Third & Market Streets, Union Square, and Clay Street in Chinatown. Includes procurement of four LRVs.
Van Ness BRT	Van Ness Avenue Bus Rapid Transit	Implement Van Ness Avenue Bus Rapid Transit (Van Ness BRT) to improve approximately two miles of a major north-south urban arterial in San Francisco. Project would include a dedicated lane for BRT buses in each direction between Mission and Lombard Streets. There will be nine BRT stations, with platforms on both sides for right-side passenger boarding and drop-off.
Treasure Island	Yerba Buena Island (YBI) I-80 Interchange Improvement	Includes two major components: 1) On the east side of the island, the I-80/YBI Ramps project will construct new westbound on- and off- ramps to the new Eastern Span of the Bay Bridge; 2) On the west side of the island, the YBI West-Side Bridges Retrofit project will seismically retrofit the existing bridge structures.
	California Street Safety Project (Quick-Build)	Reconfigure roadway from four lanes (two lanes in each direction) to three (one lane in each direction with center turn lane)
	Mission Rock - new street	Exposition Street between 3rd and Terry Francois Boulevard
TCDP	Transit Center District Plan	Road diets, transit facilities, and bike facilities consistent with the Transit Center District Plan

Muni Forward	Muni Forward, formerly TEP and TTRP	Muni TEP: Travel Time Reduction Program, Expanded level (project-level). Travel Time Reduction Program, Expanded level (project-level: 5/5R Fulton, 7 Haight, 8 Bayshore, 9 San Bruno, 14 Mission/14 R Mission Rapid/49 Mission-Van Ness, 22 Fillmore, 28 19th Ave, J Church, L Taraval, and N Judah.
Muni Forward	1 California Muni Forward (entire route)	Muni Forward improvements on the 1 California (entire line). Specific scope to be determined.
Muni Forward	5 Fulton Rapid Project: Inner Richmond segment	Add transit bulbs at various stops and optimize one stop on the 5R Fulton Rapid from Arguello to Park Presidio Boulevard.
Muni Forward	7 Haight Rapid Project: Haight Street	On Haight from Stanyan to Laguna, replace numerous stop signs with signals, transit stop improvements
Muni Forward	7 Haight Muni Forward: West of Stanyan	Muni Forward improvements on the 7 Haight-Noriega from Stanyan to the western terminal. Specific scope to be determined.
Muni Forward	8 Bayshore: Geneva & Visitacion Valley Muni Forward	Implement Muni Forward improvements on the 8 Bayshore in Visitacion Valley and on Geneva Avenue. Specific scope to be determined.
Muni Forward	14 Mission - Outer Mission Muni Forward	Implement transit priority improvements for the 14 Mission on Mission Street between Randall Street and Daly City. Specific scope to be determined.
Muni Forward	22 Fillmore: Fillmore Street Muni Forward	Implement Muni Forward improvements on the 22 Fillmore on Fillmore Street between Duboce Avenue and Bay Street. Specific scope to be determined.
Muni Forward	27 Bryant Muni Forward: Full project	Add bus bulbs at various stops on the 27 Bryant from Market to northern terminal
Muni Forward	28 19th Avenue Muni Forward	Added transit bulbs at most stops on 19th Avenue for the 28 19th Avenue; consolidate stops; optimize stops. No changes to travel lanes.
Muni Forward	29 Sunset Muni Forward	Muni Forward improeements on the 29 Sunset (entire line). Specific scope to be determined.
Muni Forward	30 Stockton: Stockton and Columbus Ave Muni Forward	Implement Muni Forward improvements on the 30 Stockton on Stockton Street in Chinatown and on Columbus Avenue in North Beach. Specific scope to be determined.
Muni Forward	J Church Muni Forward	Muni Forward improvements on the J Church (Duboce to Balboa Park Station). Scope to be determined.
Muni Forward	K Ingleside - Ocean Avenue	Install center-running transit lanes on Ocean Avenue along the K line. Extend boarding islands to accommodate 2-car trains. Consolidate some stops.
Muni Forward	L Taraval Improvements Project: Full project	Add boarding islands at all stops on Taraval Street; add five new traffic signals on Taraval street with transit signal priority; consolidate additional stops on Taraval.
Muni Forward	M Oceanview Muni Forward	Transit priority improvements on the surface alignment of the M Oceanview, focused on the Oceanview neighborhood segment. Specific scope to be determined.

Muni Forward	N Judah: Judah Street Muni Forward: Quick-build phase	On the N Judah on Judah Street, consolidate some stops, lengthen boarding platforms to accommodate 3-car trains (using temporary and reversable materials)
Muni Forward	N Judah: Judah Street Muni Forward: Full project	Replace various stop signs with signals with transit priority; upgrade transit stops with permanent boarding islands.
	2050	
Balboa Park Station Area	Balboa Park Station Area - Closure of Northbound I-280 On-Ramp from Geneva Avenue	This project would study and implement closure of the northbound I-280 on-ramp from Geneva Avenue to improve safety. Closure of the ramp would initially be a pilot project, if possible, depending on the results of traffic studies. The linked on-ramp from Ocean Avenue would remain open.
Balboa Park Station Area	Balboa Park Station Area - Southbound I-280 Off-Ramp Realignment at Ocean Avenue	This project will realign the existing uncontrolled southbound I-280 off-ramp to Ocean Avenue into a T-intersection and construct a new traffic signal on Ocean Avenue to control the off-ramp.
	Expand SFMTA Transit Fleet	This project entails future expansion of the SFMTA transit fleet and needed facilities to house and maintain transit vehicles. The purpose is to meet projected future transit demand, as indicated in the SFMTA Transit Fleet Plan. It will facilitate the future provision of additional service through the procurement of transit vehicles as well as the development of needed modern transit facilities. This also includes the expansion vehicles for Geary BRT (RTPID 17-05-0021) and does not include expansion vehicles for Central Subway, which are in RTPITD 17-05-0041.
	Historic Streetcar Extension - Fort Mason to 4th & King	The project would extend historic streetcar service by extending either the E-line or the F-line service from Fishermanâ€™s Wharf to Fort Mason, using the historic railway tunnel between Van Ness Ave. and the Fort Mason Center. The project will seek non-transit specific funds and will seek to improve the historic streetcar operation as an attractive service for tourists and visitors.
	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	Phase 1 (full implementation): Convert an existing mixed traffic lane and/or shoulder/excess ROW in each direction to HOV 3+ lanes on US 101 from SF/SM County line to I-280 interchange and on I-280 from US 101 interchange to 6th Street off ramp to enhance carpool and transit operations during peak periods.
	HOV/HOT Lanes on U.S. 101 and I-280 in San Francisco	Phase 2 (planning and environmental review only): Convert Phase 1 HOV lanes to HOT/Express Lanes. Express transit to be funded with HOT lane revenues.
	Hunters Point Shipyard Local Roads Phase 1	Build new local streets within the Hunters Point Shipyard and Candlestick Point area.

CPHPS	Southeast Waterfront Transportation Improvements - Phase 1 - Entire Corridor from Balboa Park to the Shipyard, entire BRT project	Create a 5 mile multi-modal corridor of streets, transit facilities, pedestrian paths, and dedicated bicycle lanes to link the Candlestick/Hunters Point Shipyard project area to BART, T-Third light rail, Caltrain, local bus lines and future ferry service. A BRT system (included in a RTPID 17-05-0032) would use exclusive transit right-of-way, station and shelter facilities, and transit signal priority infrastructure. This project also includes express bus and enhances transit service between the Southeast Waterfront and downtown San Francisco.

Figure 2. Regional 2040 Transportation Project List

Project	RTP ID	Description
AC Transit East Bay BRT		Upgrades the existing #1 bus route to BRT. Project includes center-median and curbside transit-only lanes and bus stations along International Boulevard from Uptown Oakland to San Leandro.
AC Transit San Pablo Ave BRT		Adds BRT service along San Pablo Ave from Oakland to Richmond.
Albany/Berkeley Ferry Terminal	17-10-0042	Construct a new Berkeley/Albany ferry terminal, purchase 2 new ferry vessels, operate new ferry service between Berkeley/Albany and San Francisco.
BART Berryessa Extension		Extend BART service from Warm Springs to Milpitas and Berryessa
BART Irvington Station		Add Irvington station between Fremont and Warm Springs
BART Metro Program + Bay Fair Connector	17-10-0005	Investments in support of the region's Sustainable Communities Strategy, including studies of a future Transbay Corridor rail crossing. Capital: Turnbacks/crossovers/tail track extensions (24th St, Lafayette, Glen Park, Millbrae, Dublin, Daly City, Richmond, South Hayward); Station capacity improvements (platform doors at 4 downtown SF stations, additional stairs/escalators/elevators Operating: 12-minute headways on all lines in the peak period (instead of current 15-minutes) Bay Fair Connector: Modify BART Bay Fair Station and approaches to add one or more additional tracks and one or more passenger platforms for efficient train service and operational flexibility. Includes station modernization, modifications to switches, tracks, crossovers, train control, signaling, traction power, etc.

BART: Silicon Valley Phase 2		BART extended from Berryessa to Alum Rock, Downtown San Jose, Diridon, and Santa Clara
Bus and Ferry Service Expansion	17-10-0010	This program includes planned bus and ferry expansion projects such as new express bus service between East Santa Rosa and San Francisco; between Richmond and San Rafael; and between Central Marin and West San Francisco. This program also includes off-site parking and an additional Larkspur Ferry crossing.
California HSR in the Bay Area	17-10-0007	This project implements the segment of California High Speed Rail that is in the Bay Area.
Caltrain Electrification Phase 1 + CBOSS	17-10-0008	The Peninsula Corridor Electrification Project (PCEP) includes the electrification of the Caltrain corridor between San Francisco and San Jose, the procurement of new, Electric Multiple Unit rolling stock, and an increase in the Caltrain service levels. This project also includes CBOSS, which is the Communications Based Overlay Signal System (CBOSS) Positive Train Control necessary to monitor and control train movements as well as increase safety.
Caltrain/HSR Downtown San Francisco Extension	17-10-0038	The Downtown Rail Extension (DTX) will extend Caltrain commuter rail from its current terminus at Fourth and King streets and deliver the California High-Speed Rail Authorityâ€™s future high-speed service to the new Transit Center. The 1.95-mile rail extension will be constructed principally below grade underneath Townsend and Second streets. The design includes an underground station at Fourth and Townsend streets, utility relocations, rail systems work, and structures for emergency exit, ventilation at six locations along the alignment, and an underground pedestrian bridge connecting the Transbay Terminal to the Embarcadero BART station. Cost includes operating expenses - capital cost is $3.999 billion
Central Bay Ferry Service Enhancement	17-10-0041	Purchase and operate 2 new ferry vessels for WETA Central Bay ferry services. Project increases frequency for the Oakland-Alameda-SF ferry line and the Harbor Bay-SF ferry line.
eBART		eBART line from Pittsburg to Antioch
Implement Transbay Transit Center/Caltrain Downtown Extension (Phase 1 - Transbay Transit Center)	17-10-0039	The project has 3 components: (1) new Transbay Transit Center built on the site of the former Transbay Terminal in downtown San Francisco serving 11 transportation systems; (2) extension of Caltrain commuter rail service from its current San Francisco terminus at 4th & King Streets to a new underground terminus; and (3) establishment of a Redevelopment Area Plan with related development projects.

North Bay Ferry Service Enhancement	17-10-0040	Purchase and operate 2 new ferry vessels for WETA North Bay ferry services. Project increases frequency for the Richmond-SF and Vallejo-SF ferry lines.
SMART: Larkspur to San Rafael		SMART - Extend SMART from San Rafael to Larkspur
SMART: Santa Rosa to Cloverdale		SMART - Extend SMART from Santa Rosa to Cloverdale

ATTACHMENT C

TRAVEL DEMAND SUMMARIES

MODE OF TRAVEL SUMMARY BY SUBAREA

San Francisco Waterfront Land Use Plan

Trip Generation Summary

Total All Day

	PERSON TRIPS						VEHICLE TRIPS			
	Drive	Transit	Taxi/TNC	Walk	Bike	All Trips	Auto	Taxi/TNC	Commercial	All Trips
2020 BASELINE										
Total Waterfront Area	72,139	26,063	10,372	19,646	3,602	131,822	87,301	7,641	47,134	142,076
Fisherman's Wharf	13,440	3,507	2,157	3,972	697	23,773	40,284	1,577	10,437	52,298
NE Waterfront / Ferry Bldg.	15,256	9,879	3,563	6,989	976	36,663	14,807	2,617	10,707	28,131
South Beach / China Basin	15,427	9,486	3,064	5,789	948	34,714	11,360	2,262	14,302	27,924
Mission Bay	2,810	613	279	434	125	4,261	2,148	208	1,355	3,711
Southern Waterfront	25,206	2,578	1,309	2,462	856	32,411	18,702	977	10,333	30,012
WLU PLAN ONLY (Based on 2020 model data)										
Total Waterfront Area	24,184	10,637	4,024	7,879	1,412	48,136	18,126	3,131	16,520	37,777
Fisherman's Wharf	460	390	2	265	98	1,215	353	44	192	589
NE Waterfront / Ferry Bldg.	7,188	3,384	1,337	2,511	518	14,938	5,472	1,015	5,018	11,505
South Beach / China Basin	15,219	6,668	2,608	4,826	758	30,079	11,219	1,984	9,900	23,103
Mission Bay	91	-39	2	-24	-2	28	20	1	111	132
Southern Waterfront	1,226	234	75	301	40	1,876	1,062	87	1,299	2,448
2020 BASELINE with Plan										
Total Waterfront Area	96,323	36,700	14,396	27,525	5,014	179,958	105,427	10,772	63,654	179,853
Fisherman's Wharf	13,900	3,897	2,159	4,237	795	24,988	40,637	1,621	10,629	52,887
NE Waterfront / Ferry Bldg.	22,444	13,263	4,900	9,500	1,494	51,601	20,279	3,632	15,725	39,636
South Beach / China Basin	30,646	16,154	5,672	10,615	1,706	64,793	22,579	4,246	24,202	51,027
Mission Bay	2,901	574	281	410	123	4,289	2,168	209	1,466	3,843
Southern Waterfront	26,432	2,812	1,384	2,763	896	34,287	19,764	1,064	11,632	32,460
2020 BASE to 2050 BASE GROWTH (No Plan)										
Total Waterfront Area	55,624	30,121	13,641	22,146	4,235	125,767	36,072	10,200	19,879	66,151
Fisherman's Wharf	529	636	678	156	48	2,047	-1,443	561	6	-876
NE Waterfront / Ferry Bldg.	3,284	2,850	3,044	1,697	178	11,053	1,505	2,230	805	4,540
South Beach / China Basin	1,166	1,817	3,078	1,337	1	7,399	506	2,266	-152	2,620
Mission Bay	11,212	5,579	2,850	3,424	717	23,782	8,144	2,146	6,193	16,483
Southern Waterfront	39,433	19,239	3,991	15,532	3,291	81,486	27,360	2,997	13,027	43,384
2050 BASELINE										
Total Waterfront Area	127,763	56,184	24,013	41,792	7,837	257,589	123,373	17,841	67,013	208,227
Fisherman's Wharf	13,969	4,143	2,835	4,128	745	25,820	38,841	2,138	10,443	51,422
NE Waterfront / Ferry Bldg.	18,540	12,729	6,607	8,686	1,154	47,716	16,312	4,847	11,512	32,671
South Beach / China Basin	16,593	11,303	6,142	7,126	949	42,113	11,866	4,528	14,150	30,544
Mission Bay	14,022	6,192	3,129	3,858	842	28,043	10,292	2,354	7,548	20,194
Southern Waterfront	64,639	21,817	5,300	17,994	4,147	113,897	46,062	3,974	23,360	73,396
WLU PLAN ONLY (Based on 2050 model data)										
Total Waterfront Area	23,372	11,951	7,146	8,095	1,356	51,920	16,538	5,382	16,156	38,076
Fisherman's Wharf	511	454	263	140	75	1,443	391	138	267	796
NE Waterfront / Ferry Bldg.	6,287	3,305	1,656	2,352	385	13,985	4,919	1,366	5,040	11,325
South Beach / China Basin	15,827	7,691	4,932	5,636	807	34,893	11,109	3,653	9,740	24,502
Mission Bay	351	-10	101	173	42	657	55	105	120	280
Southern Waterfront	396	511	194	-206	47	942	64	120	989	1,173
2050 BASELINE with Plan										
Total Waterfront Area	151,135	68,135	31,159	49,887	9,193	309,509	139,911	23,223	83,169	246,303
Fisherman's Wharf	14,480	4,597	3,098	4,268	820	27,263	39,232	2,276	10,710	52,218
NE Waterfront / Ferry Bldg.	24,827	16,034	8,263	11,038	1,539	61,701	21,231	6,213	16,552	43,996
South Beach / China Basin	32,420	18,994	11,074	12,762	1,756	77,006	22,975	8,181	23,890	55,046
Mission Bay	14,373	6,182	3,230	4,031	884	28,700	10,347	2,459	7,668	20,474
Southern Waterfront	65,035	22,328	5,494	17,788	4,194	114,839	46,126	4,094	24,349	74,569

San Francisco Waterfront Land Use Plan

Trip Generation Summary

AM Peak Hour

	PERSON TRIPS						VEHICLE TRIPS			
	Drive	Transit	Taxi/TNC	Walk	Bike	All Trips	Auto	Taxi/TNC	Commercial	All Trips
2020 BASELINE										
Total Waterfront Area	4,149	2,164	574	774	227	7,888	4,392	442	1,858	6,692
Fisherman's Wharf	777	277	120	183	43	1,400	1,669	94	418	2,181
NE Waterfront / Ferry Bldg.	915	823	176	262	57	2,233	822	140	430	1,392
South Beach / China Basin	885	802	182	201	59	2,129	680	133	570	1,383
Mission Bay	183	55	15	24	8	285	131	11	52	194
Southern Waterfront	1,389	207	81	104	60	1,841	1,090	64	388	1,542
WLU PLAN ONLY (Based on 2020 model data)										
Total Waterfront Area	1,541	973	198	295	103	3,110	1,236	165	678	2,079
Fisherman's Wharf	45	35	-6	17	8	99	41	-3	11	49
NE Waterfront / Ferry Bldg.	474	309	72	117	29	1,001	389	52	211	652
South Beach / China Basin	940	610	128	156	60	1,894	720	110	398	1,228
Mission Bay	-12	-12	1	-10	1	-32	4	1	5	10
Southern Waterfront	94	31	3	15	5	148	82	5	53	140
2020 BASELINE with Plan										
Total Waterfront Area	5,690	3,138	772	1,069	330	10,999	5,628	607	2,536	8,771
Fisherman's Wharf	822	312	114	200	51	1,499	1,710	91	429	2,230
NE Waterfront / Ferry Bldg.	1,389	1,132	248	379	86	3,234	1,211	192	641	2,044
South Beach / China Basin	1,825	1,413	310	357	119	4,024	1,400	243	968	2,611
Mission Bay	171	43	16	14	9	253	135	12	57	204
Southern Waterfront	1,483	238	84	119	65	1,989	1,172	69	441	1,682
2020 BASE to 2050 BASE GROWTH (No Plan)										
Total Waterfront Area	3,327	2,400	712	956	311	7,706	2,314	563	828	3,705
Fisherman's Wharf	25	47	42	-5	-3	106	-52	29	10	-13
NE Waterfront / Ferry Bldg.	132	209	136	80	15	572	55	100	42	197
South Beach / China Basin	31	129	130	85	0	375	-16	113	7	104
Mission Bay	750	507	178	157	56	1,648	584	141	249	974
Southern Waterfront	2,389	1,508	226	639	243	5,005	1,743	180	520	2,443
2050 BASELINE										
Total Waterfront Area	7,476	4,564	1,286	1,730	538	15,594	6,706	1,005	2,686	10,397
Fisherman's Wharf	802	324	162	178	40	1,506	1,617	123	428	2,168
NE Waterfront / Ferry Bldg.	1,047	1,033	312	342	72	2,806	877	240	472	1,589
South Beach / China Basin	916	931	312	286	59	2,504	664	246	577	1,487
Mission Bay	933	562	193	181	64	1,933	715	152	301	1,168
Southern Waterfront	3,778	1,715	307	743	303	6,846	2,833	244	908	3,985
WLU PLAN ONLY (Based on 2050 model data)										
Total Waterfront Area	1,420	1,054	418	296	54	3,242	1,021	319	663	2,003
Fisherman's Wharf	39	33	8	-5	10	85	20	7	12	39
NE Waterfront / Ferry Bldg.	395	293	123	83	14	908	318	95	212	625
South Beach / China Basin	942	674	259	211	46	2,132	690	199	396	1,285
Mission Bay	7	-27	5	4	-4	-15	-1	3	5	7
Southern Waterfront	37	82	23	3	-12	133	-6	15	38	47
2050 BASELINE with Plan										
Total Waterfront Area	8,896	5,618	1,704	2,026	592	18,836	7,727	1,324	3,349	12,400
Fisherman's Wharf	841	356	170	173	50	1,590	1,637	130	440	2,207
NE Waterfront / Ferry Bldg.	1,442	1,325	435	425	86	3,713	1,195	335	684	2,214
South Beach / China Basin	1,858	1,605	571	497	105	4,636	1,354	445	973	2,772
Mission Bay	940	535	198	185	60	1,918	714	155	306	1,175
Southern Waterfront	3,815	1,797	330	746	291	6,979	2,827	259	946	4,032

San Francisco Waterfront Land Use Plan

Trip Generation Summary

PM Peak Hour

	PERSON TRIPS						VEHICLE TRIPS			
	Drive	Transit	Taxi/TNC	Walk	Bike	All Trips	Auto	Taxi/TNC	Commercial	All Trips
2020 BASELINE										
Total Waterfront Area	5,639	2,352	860	1,225	275	10,351	7,136	633	1,942	9,711
Fisherman's Wharf	1,037	310	177	282	54	1,860	3,390	131	420	3,941
NE Waterfront / Ferry Bldg.	1,188	865	289	435	76	2,853	1,188	210	437	1,835
South Beach / China Basin	1,190	887	255	323	72	2,727	892	190	587	1,669
Mission Bay	221	55	28	27	11	342	175	19	57	251
Southern Waterfront	2,003	234	111	158	62	2,568	1,491	83	441	2,015
WLU PLAN ONLY (Based on 2020 model data)										
Total Waterfront Area	1,925	966	346	447	146	3,830	1,470	276	681	2,427
Fisherman's Wharf	22	42	-1	-5	16	74	20	0	11	31
NE Waterfront / Ferry Bldg.	567	318	128	141	46	1,200	454	103	204	761
South Beach / China Basin	1,246	576	212	289	70	2,393	901	166	407	1,474
Mission Bay	11	-1	-5	-6	-1	-2	0	-2	5	3
Southern Waterfront	79	31	12	28	15	165	95	9	54	158
2020 BASELINE with Plan										
Total Waterfront Area	7,564	3,317	1,206	1,672	421	14,180	8,606	909	2,623	12,138
Fisherman's Wharf	1,059	353	176	277	70	1,935	3,410	131	431	3,972
NE Waterfront / Ferry Bldg.	1,755	1,183	417	576	122	4,053	1,642	313	641	2,596
South Beach / China Basin	2,436	1,463	467	612	142	5,120	1,793	356	994	3,143
Mission Bay	232	54	23	21	10	340	175	17	62	254
Southern Waterfront	2,082	265	123	186	77	2,733	1,586	92	495	2,173
2020 BASE to 2050 BASE GROWTH (No Plan)										
Total Waterfront Area	3,724	2,529	1,124	1,475	350	9,202	2,442	843	844	4,129
Fisherman's Wharf	-8	30	47	-11	2	60	-161	38	5	-118
NE Waterfront / Ferry Bldg.	192	257	259	78	13	799	87	192	35	314
South Beach / China Basin	94	111	269	135	-1	608	27	186	-4	209
Mission Bay	814	500	212	217	56	1,799	606	173	259	1,038
Southern Waterfront	2,632	1,631	337	1,056	280	5,936	1,883	254	549	2,686
2050 BASELINE										
Total Waterfront Area	9,363	4,880	1,984	2,700	625	19,552	9,578	1,476	2,786	13,840
Fisherman's Wharf	1,029	340	224	271	56	1,920	3,229	169	425	3,823
NE Waterfront / Ferry Bldg.	1,380	1,122	548	513	89	3,652	1,275	402	472	2,149
South Beach / China Basin	1,284	998	524	458	71	3,335	919	376	583	1,878
Mission Bay	1,035	555	240	244	67	2,141	781	192	316	1,289
Southern Waterfront	4,635	1,865	448	1,214	342	8,504	3,374	337	990	4,701
WLU PLAN ONLY (Based on 2050 model data)										
Total Waterfront Area	1,869	1,045	549	462	127	4,052	1,313	441	668	2,422
Fisherman's Wharf	44	62	30	7	21	164	31	24	10	65
NE Waterfront / Ferry Bldg.	492	315	97	161	34	1,099	372	99	207	678
South Beach / China Basin	1,117	688	412	318	72	2,607	803	308	401	1,512
Mission Bay	84	-22	24	-2	0	84	29	11	6	46
Southern Waterfront	132	3	-14	-22	0	99	78	-1	44	121
2050 BASELINE with Plan										
Total Waterfront Area	11,232	5,925	2,533	3,162	752	23,604	10,891	1,917	3,454	16,262
Fisherman's Wharf	1,073	402	254	278	77	2,084	3,260	193	435	3,888
NE Waterfront / Ferry Bldg.	1,872	1,437	645	674	123	4,751	1,647	501	679	2,827
South Beach / China Basin	2,401	1,686	936	776	143	5,942	1,722	684	984	3,390
Mission Bay	1,119	533	264	242	67	2,225	810	203	322	1,335
Southern Waterfront	4,767	1,867	434	1,192	342	8,602	3,452	336	1,034	4,822

TRANSIT TRIP SUMMARY BY TAZ

San Francisco Waterfront Land Use Plan

Transit Trip Summary

AM Peak Hour

		TRANSIT PERSON TRIPS																			
		2020 Baseline			2020 Base with Plan			Plan (based on 2020)			2050 Baseline			2020 to 2050 Base Growth			2050 Base with Plan			Plan (based on 2050)		
TAZ	District	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Waterfront Area		1,817	347	2,164	2,736	402	3,138	919	54	973	3,106	1,458	4,564	1,289	1,111	2,400	4,050	1,567	5,618	945	109	1,054
Fisherman's Wharf																						
847	3	25	6	32	21	9	30	-5	2	-2	33	11	44	7	5	12	30	8	38	-3	-2	-5
851	3	38	6	44	65	12	77	27	6	34	44	10	54	6	5	10	69	12	81	26	2	28
853	3	31	57	88	32	50	83	1	-7	-6	38	59	97	7	2	9	41	68	109	3	9	11
855	3	104	9	113	115	7	122	11	-2	9	117	13	129	13	3	16	115	13	128	-2	1	-1
Total		199	78	277	234	78	312	35	0	35	231	93	324	32	14	47	255	102	356	24	9	33
NE Waterfront / Ferry Building																						
778	1	241	17	258	236	19	255	-5	2	-2	268	24	292	27	7	34	263	24	287	-5	0	-5
808	1	102	9	111	100	9	109	-2	0	-2	111	13	124	9	4	13	104	9	113	-7	-3	-10
814	3	73	16	88	72	17	89	0	1	1	109	15	124	37	-1	35	103	17	120	-7	2	-4
828	3	57	4	62	136	7	143	79	2	81	62	2	64	5	-2	3	152	8	160	90	5	96
829	3	109	44	153	128	42	171	19	-2	17	133	48	181	24	4	28	138	55	193	5	7	12
830	3	9	13	22	101	18	118	92	5	96	80	24	103	71	10	81	149	34	183	69	10	79
835	3	32	4	35	34	5	38	2	1	3	38	4	42	6	0	6	40	2	41	2	-2	0
854	3	12	1	13	122	9	131	110	8	118	10	0	10	-2	-1	-3	127	7	135	117	7	124
958	3	74	6	80	72	6	77	-2	-1	-3	84	8	92	10	2	12	85	8	93	1	0	1
Total		709	114	823	1,001	131	1,132	292	16	309	894	138	1,033	185	24	209	1,161	164	1,325	267	26	293
South Beach / China Basin																						
633	2	11	15	26	15	16	30	3	1	4	12	15	26	0	0	0	13	12	25	1	-2	-2
723	2	36	5	40	538	40	578	502	36	538	35	8	44	-1	4	3	620	56	677	585	48	633
725	2	55	23	78	68	23	91	13	0	13	62	32	94	7	8	16	73	28	102	11	-3	8
762	2	333	31	364	345	31	376	12	0	12	384	52	436	51	21	72	353	45	397	-31	-8	-39
763	2	261	26	287	256	22	277	-5	-4	-9	284	39	323	23	13	36	307	32	339	23	-7	17
926	2	5	2	7	55	4	59	50	2	53	7	1	9	2	0	2	58	6	65	51	5	56
Total		701	101	802	1,276	136	1,413	575	35	610	784	147	931	83	46	129	1,425	180	1,605	641	33	674
Mission Bay																						
649	5	10	1	11	7	1	8	-3	0	-2	9	4	13	-1	3	2	7	3	10	-2	-1	-3
650	5	5	2	7	4	1	6	-1	-1	-1	6	2	8	1	0	1	6	2	8	0	0	0
655	5	35	2	37	27	2	29	-8	0	-8	394	148	541	359	145	504	365	152	517	-29	5	-24
Total		49	6	55	38	5	43	-11	0	-12	409	153	562	359	148	507	377	157	535	-31	4	-27
Southern Waterfront																						
444	9	5	0	5	5	1	6	0	1	1	5	1	6	0	1	1	4	2	6	-1	1	0
492	5	10	2	12	14	1	15	4	-1	3	22	3	26	12	1	14	20	3	24	-2	0	-2
493	9	10	0	10	14	0	14	4	0	4	11	1	11	1	0	1	19	1	19	8	0	8
521	5	70	38	108	70	40	110	-1	3	2	275	293	568	205	255	460	289	302	591	14	9	23
522	5	40	6	45	51	6	57	11	0	11	64	12	76	25	6	31	67	15	82	3	3	6
559	5	24	2	27	34	3	37	9	0	10	411	617	1,028	386	615	1,001	433	641	1,074	23	24	46
Total		159	48	207	187	51	238	28	3	31	788	927	1,715	628	879	1,508	832	965	1,797	45	37	82

San Francisco Waterfront Land Use Plan

Transit Trip Summary

PM Peak Hour

		TRANSIT PERSON TRIPS																			
		2020 Baseline			2020 Base with Plan			Plan (based on 2020)			2050 Baseline			2020 to 2050 Base Growth			2050 Base with Plan			Plan (based on 2050)		
TAZ	District	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Waterfront Area		591	1,760	2,352	726	2,592	3,317	134	831	966	1,691	3,189	4,880	1,099	1,429	2,529	1,821	4,104	5,925	130	914	1,045
Fisherman's Wharf																						
847	3	18	28	46	19	29	48	0	2	2	14	29	43	-4	1	-3	20	32	52	6	3	9
851	3	16	41	58	23	57	79	6	15	22	20	38	57	3	-4	0	29	75	104	10	37	47
853	3	49	44	92	53	42	96	5	-1	3	63	51	114	14	7	21	60	52	112	-3	2	-1
855	3	17	97	115	18	112	130	1	14	15	21	105	126	4	8	12	24	110	133	3	4	7
Total		100	210	310	112	240	353	12	30	42	118	222	340	18	12	30	133	269	402	16	46	62
NE Waterfront / Ferry Building																						
778	1	53	226	280	48	222	270	-5	-4	-9	70	257	328	17	31	48	71	260	331	1	2	4
808	1	21	90	111	19	89	108	-2	-1	-3	24	84	108	3	-6	-3	26	106	132	2	22	24
814	3	23	70	94	24	70	94	0	0	0	26	97	123	3	27	29	33	96	129	7	-1	6
828	3	9	53	62	20	120	140	11	67	78	10	58	68	1	5	6	19	135	154	8	78	86
829	3	48	107	154	52	124	177	5	18	22	67	137	204	19	30	50	58	142	200	-9	5	-4
830	3	14	10	24	37	103	141	24	93	117	43	89	132	29	79	108	55	152	208	12	64	76
835	3	7	30	37	6	30	36	-1	0	-1	7	36	42	0	6	5	9	37	45	2	1	3
854	3	2	12	14	18	108	125	16	96	112	5	13	18	3	2	4	19	123	141	14	109	123
958	3	17	72	90	15	76	91	-2	4	2	17	83	100	0	10	10	18	79	97	1	-4	-3
Total		194	671	865	239	944	1,183	44	273	318	269	854	1,122	74	183	257	308	1,129	1,437	39	275	315
South Beach / China Basin																						
633	2	15	12	28	12	16	28	-3	4	0	16	12	28	0	0	0	10	10	21	-5	-2	-7
723	2	9	35	43	94	498	591	85	463	548	15	40	55	6	5	11	121	568	689	106	528	634
725	2	38	68	106	35	71	105	-3	3	0	39	75	114	1	7	8	37	74	112	-2	-1	-2
762	2	82	325	407	71	324	395	-11	0	-11	90	346	436	8	21	29	96	330	426	6	-16	-10
763	2	55	239	295	55	227	283	0	-12	-12	82	271	353	27	32	59	74	305	379	-8	34	26
926	2	4	5	9	7	53	60	3	48	51	5	7	12	1	2	3	9	51	60	4	44	48
Total		204	683	887	274	1,189	1,463	70	506	576	247	752	998	43	68	111	347	1,339	1,686	100	587	688
Mission Bay																						
649	5	3	8	11	2	6	8	-1	-2	-3	5	9	14	2	1	3	4	8	12	-1	-1	-2
650	5	2	4	6	5	5	10	4	1	4	4	5	10	3	1	4	3	7	10	-1	2	0
655	5	8	30	38	9	27	36	1	-3	-2	144	388	531	135	358	493	140	371	511	-4	-16	-20
Total		13	42	55	17	37	54	3	-4	-1	153	402	555	140	360	500	147	386	533	-7	-16	-22
Southern Waterfront																						
444	9	1	5	5	2	5	7	1	1	2	2	5	7	1	1	2	2	4	5	0	-2	-2
492	5	4	10	14	2	13	15	-2	3	1	8	23	31	4	12	17	9	19	28	1	-4	-3
493	9	2	7	8	1	10	11	0	3	3	2	9	11	0	3	3	3	14	17	1	4	5
521	5	50	74	124	57	78	135	7	3	11	304	318	622	254	244	498	305	343	649	2	25	27
522	5	18	39	57	18	40	58	0	2	1	33	68	102	16	30	45	29	70	99	-4	1	-3
559	5	6	19	25	5	34	39	-1	15	14	555	535	1,091	549	517	1,066	538	531	1,069	-17	-4	-22
Total		80	154	234	85	181	265	5	27	31	905	960	1,865	825	806	1,631	886	981	1,867	-18	21	3

VEHICLE TRIP SUMMARY BY TAZ

San Francisco Waterfront Land Use Plan

Vehicle Trip Summary

AM Peak Hour

		ALL VEHICLE TRIPS																			
		2020 Baseline			2020 Base with Plan			Plan (based on 2020)			2050 Baseline			2020 to 2050 Base Growth			2050 Base with Plan			Plan (based on 2050)		
TAZ	District	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Waterfront Area		4,256	2,436	6,692	5,767	3,004	8,771	1,511	568	2,079	6,183	4,214	10,397	1,927	1,778	3,705	7,611	4,789	12,400	1,428	575	2,003
Fisherman's Wharf																						
847	3	322	239	561	326	241	567	4	2	6	310	226	536	-12	-13	-25	305	221	526	-5	-5	-10
851	3	367	277	644	410	290	700	43	13	56	360	274	634	-7	-3	-10	409	286	695	49	12	61
853	3	86	85	171	84	81	165	-2	-4	-6	105	89	194	19	4	23	105	90	195	0	1	1
855	3	521	284	805	518	280	798	-3	-4	-7	517	287	804	-4	3	-1	507	284	791	-10	-3	-13
Total		1,296	885	2,181	1,338	892	2,230	42	7	49	1,292	876	2,168	-4	-9	-13	1,326	881	2,207	34	5	39
NE Waterfront / Ferry Building																						
778	1	186	99	285	183	102	285	-3	3	0	188	109	297	2	10	12	188	107	295	0	-2	-2
808	1	127	82	209	132	83	215	5	1	6	126	82	208	-1	0	-1	134	87	221	8	5	13
814	3	72	56	128	70	60	130	-2	4	2	89	67	156	17	11	28	80	63	143	-9	-4	-13
828	3	92	34	126	220	76	296	128	42	170	93	36	129	1	2	3	210	77	287	117	41	158
829	3	224	118	342	214	117	331	-10	-1	-11	233	126	359	9	8	17	230	127	357	-3	1	-2
830	3	13	19	32	90	56	146	77	37	114	91	61	152	78	42	120	159	95	254	68	34	102
835	3	78	25	103	77	24	101	-1	-1	-2	79	24	103	1	-1	0	73	27	100	-6	3	-3
854	3	35	13	48	322	106	428	287	93	380	46	19	65	11	6	17	326	115	441	280	96	376
958	3	79	40	119	75	37	112	-4	-3	-7	80	40	120	1	0	1	78	38	116	-2	-2	-4
Total		906	486	1,392	1,383	661	2,044	477	175	652	1,025	564	1,589	119	78	197	1,478	736	2,214	453	172	625
South Beach / China Basin																						
633	2	22	26	48	25	24	49	3	-2	1	25	31	56	3	5	8	27	32	59	2	1	3
723	2	67	32	99	867	354	1,221	800	322	1,122	64	32	96	-3	0	-3	857	384	1,241	793	352	1,145
725	2	146	110	256	139	106	245	-7	-4	-11	153	110	263	7	0	7	149	113	262	-4	3	-1
762	2	330	206	536	321	202	523	-9	-4	-13	328	245	573	-2	39	37	331	250	581	3	5	8
763	2	289	135	424	277	137	414	-12	2	-10	307	175	482	18	40	58	291	170	461	-16	-5	-21
926	2	13	7	20	114	45	159	101	38	139	11	6	17	-2	-1	-3	116	52	168	105	46	151
Total		867	516	1,383	1,743	868	2,611	876	352	1,228	888	599	1,487	21	83	104	1,771	1,001	2,772	883	402	1,285
Mission Bay																						
649	5	26	12	38	22	11	33	-4	-1	-5	24	12	36	-2	0	-2	29	15	44	5	3	8
650	5	14	6	20	16	7	23	2	1	3	15	7	22	1	1	2	16	7	23	1	0	1
655	5	96	40	136	105	43	148	9	3	12	659	451	1,110	563	411	974	656	452	1,108	-3	1	-2
Total		136	58	194	143	61	204	7	3	10	698	470	1,168	562	412	974	701	474	1,175	3	4	7
Southern Waterfront																						
444	9	39	15	54	55	19	74	16	4	20	44	18	62	5	3	8	52	21	73	8	3	11
492	5	114	44	158	115	44	159	1	0	1	126	51	177	12	7	19	120	46	166	-6	-5	-11
493	9	89	30	119	114	38	152	25	8	33	85	33	118	-4	3	-1	114	39	153	29	6	35
521	5	382	231	613	384	227	611	2	-4	-2	862	658	1,520	480	427	907	855	638	1,493	-7	-20	-27
522	5	261	103	364	257	103	360	-4	0	-4	272	120	392	11	17	28	261	118	379	-11	-2	-13
559	5	166	68	234	235	91	326	69	23	92	891	825	1,716	725	757	1,482	933	835	1,768	42	10	52
Total		1,051	491	1,542	1,160	522	1,682	109	31	140	2,280	1,705	3,985	1,229	1,214	2,443	2,335	1,697	4,032	55	-8	47

San Francisco Waterfront Land Use Plan

Vehicle Trip Summary

PM Peak Hour

		ALL VEHICLE TRIPS																		
		2020 Baseline			2020 Base with Plan			Plan (based on 2020)			2050 Baseline			2020 to 2050 Base Growth			2050 Base with Plan			Plan (based on 2050)		
TAZ	District	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Waterfront Area		4,166	5,545	9,711	5,005	7,133	12,138	839	1,588	2,427	6,137	7,703	13,840	1,971	2,158	4,129	7,048	9,214	16,262	911	1,511	2,422
Fisherman's Wharf																						
847	3	568	646	1,214	562	637	1,199	-6	-9	-15	524	595	1,119	-44	-51	-95	527	599	1,126	3	4	7
851	3	632	703	1,335	646	741	1,387	14	38	52	608	673	1,281	-24	-30	-54	634	721	1,355	26	48	74
853	3	103	95	198	102	109	211	-1	14	13	112	124	236	9	29	38	116	116	232	4	-8	-4
855	3	495	699	1,194	489	686	1,175	-6	-13	-19	498	689	1,187	3	-10	-7	495	680	1,175	-3	-9	-12
Total		1,798	2,143	3,941	1,799	2,173	3,972	1	30	31	1,742	2,081	3,823	-56	-62	-118	1,772	2,116	3,888	30	35	65
NE Waterfront / Ferry Building																						
778	1	162	223	385	172	231	403	10	8	18	190	240	430	28	17	45	184	240	424	-6	0	-6
808	1	175	217	392	179	221	400	4	4	8	170	214	384	-5	-3	-8	173	217	390	3	3	6
814	3	75	89	164	74	89	163	-1	0	-1	89	106	195	14	17	31	87	104	191	-2	-2	-4
828	3	45	88	133	102	221	323	57	133	190	47	97	144	2	9	11	112	216	328	65	119	184
829	3	159	245	404	165	243	408	6	-2	4	176	257	433	17	12	29	169	250	419	-7	-7	-14
830	3	29	23	52	87	111	198	58	88	146	104	123	227	75	100	175	149	191	340	45	68	113
835	3	37	77	114	39	78	117	2	1	3	38	79	117	1	2	3	34	73	107	-4	-6	-10
854	3	17	32	49	139	310	449	122	278	400	29	51	80	12	19	31	158	329	487	129	278	407
958	3	55	87	142	54	81	135	-1	-6	-7	54	85	139	-1	-2	-3	55	86	141	1	1	2
Total		754	1,081	1,835	1,011	1,585	2,596	257	504	761	897	1,252	2,149	143	171	314	1,121	1,706	2,827	224	454	678
South Beach / China Basin																						
633	2	31	30	61	31	31	62	0	1	1	37	33	70	6	3	9	36	35	71	-1	2	1
723	2	51	77	128	523	911	1,434	472	834	1,306	62	83	145	11	6	17	574	925	1,499	512	842	1,354
725	2	146	172	318	145	165	310	-1	-7	-8	160	186	346	14	14	28	161	174	335	1	-12	-11
762	2	266	360	626	264	363	627	-2	3	1	320	391	711	54	31	85	317	376	693	-3	-15	-18
763	2	194	315	509	191	312	503	-3	-3	-6	234	342	576	40	27	67	238	341	579	4	-1	3
926	2	11	16	27	77	130	207	66	114	180	14	16	30	3	0	3	84	129	213	70	113	183
Total		699	970	1,669	1,231	1,912	3,143	532	942	1,474	827	1,051	1,878	128	81	209	1,410	1,980	3,390	583	929	1,512
Mission Bay																						
649	5	24	32	56	23	31	54	-1	-1	-2	23	30	53	-1	-2	-3	26	34	60	3	4	7
650	5	11	16	27	12	16	28	1	0	1	11	16	27	0	0	0	14	17	31	3	1	4
655	5	61	107	168	62	110	172	1	3	4	511	698	1,209	450	591	1,041	521	723	1,244	10	25	35
Total		96	155	251	97	157	254	1	2	3	545	744	1,289	449	589	1,038	561	774	1,335	16	30	46
Southern Waterfront																						
444	9	23	41	64	32	58	90	9	17	26	26	42	68	3	1	4	32	55	87	6	13	19
492	5	80	131	211	75	130	205	-5	-1	-6	79	136	215	-1	5	4	78	133	211	-1	-3	-4
493	9	46	89	135	52	114	166	6	25	31	42	87	129	-4	-2	-6	55	113	168	13	26	39
521	5	354	460	814	357	458	815	3	-2	1	888	1,023	1,911	534	563	1,097	896	1,012	1,908	8	-11	-3
522	5	203	295	498	203	295	498	0	0	0	218	309	527	15	14	29	223	307	530	5	-2	3
559	5	113	180	293	148	251	399	35	71	106	873	978	1,851	760	798	1,558	900	1,018	1,918	27	40	67
Total		819	1,196	2,015	867	1,306	2,173	48	110	158	2,126	2,575	4,701	1,307	1,379	2,686	2,184	2,638	4,822	58	63	121

ATTACHMENT D

AVERAGE DAILY VMT PER CAPITA BY TAZ

San Francisco Waterfront Land Use Plan

Average daily VMT per capita - Subarea Level

Year 2020 Baseline [a]

Location	Resid. VMT	Population	Resid. VMT per capita	Work VMT	Workers	Work VMT per capita	Retail VMT	Retail Size	Retail VMT per capita
SF Bay Area	121,419,506	6,531,060	18.6	74,772,790	2,905,546	25.7	91,474,620	6,130,028	14.9
SF Bay Area minus 15%			15.8			21.9			12.7
All San Francisco	6,788,287	793,173	8.6	7,931,433	561,663	14.1	7,084,760	1,039,221	6.8
Waterfront Area	19,179	2,811	6.8	311,976	18,839	16.6	161,436	45,789	3.5
Waterfront Subareas									
Fisherman's Wharf	4,181	729	5.7	62,136	3,442	18.1	34,055	14,662	2.3
NE Wtrfrnt / Ferry Bldg.	5,052	815	6.2	77,688	5,177	15.0	35,038	7,680	4.6
So. Beach / China B.	4,712	628	7.5	77,583	5,985	13.0	38,658	16,741	2.3
Mission Bay	0	3	0.0	10,768	552	19.5	5,005	760	6.6
Southern Waterfront	5,234	636	8.2	83,800	3,683	22.8	48,680	5,946	8.2

[a] Source: vmt_raw_update.csv for 2020 Baseline, SFCTA, April 2021

Year 2020 Baseline plus Plan [b]

Location	Resid. VMT	Population	Resid. VMT per capita	Work VMT	Workers	Work VMT per capita	Retail VMT	Retail Size	Retail VMT per capita
SF Bay Area	120,336,053	6,531,244	18.4	73,966,972	2,904,090	25.5	90,785,998	6,138,915	14.8
SF Bay Area minus 15%			15.7			21.6			12.6
All San Francisco	6,686,549	793,581	8.4	7,975,862	569,522	14.0	7,032,187	1,048,108	6.7
Waterfront Area	22,920	3,204	7.2	487,689	29,545	16.5	202,313	54,589	3.7
Waterfront Subareas									
Fisherman's Wharf	4,128	741	5.6	64,971	3,716	17.5	33,615	14,787	2.3
NE Wtrfrnt / Ferry Bldg.	5,449	830	6.6	136,827	8,655	15.8	46,606	10,093	4.6
So. Beach / China B.	8,083	988	8.2	181,816	12,390	14.7	68,332	22,939	3.0
Mission Bay	8	3	2.6	11,502	562	20.5	4,808	762	6.3
Southern Waterfront	5,252	642	8.2	92,573	4,222	21.9	48,953	6,008	8.1

[b] Source: vmt_raw_update.csv for 2020 plus Plan, SFCTA, April 2021

San Francisco Waterfront Land Use Plan

Average daily VMT per capita - Subarea Level

Year 2050 Baseline [c]

Location	Resid. VMT	Population	Resid. VMT per capita	Work VMT	Workers	Work VMT per capita	Retail VMT	Retail Size	Retail VMT per capita
SF Bay Area	145,034,174	8,481,168	17.1	84,195,311	3,538,892	23.8	115,788,738	7,390,112	15.7
SF Bay Area minus 15%			14.5			20.2			13.3
All San Francisco	8,419,057	989,429	8.5	8,237,503	656,058	12.6	8,523,341	1,129,262	7.5
Waterfront Area	124,332	18,851	6.6	452,631	31,033	14.6	261,838	56,768	4.6
Waterfront Subareas									
Fisherman's Wharf	3,926	724	5.4	59,677	3,547	16.8	36,987	14,767	2.5
NE Wtrfrnt / Ferry Bldg.	5,987	897	6.7	74,621	5,898	12.7	46,666	8,950	5.2
So. Beach / China B.	10,664	1,147	9.3	68,959	6,139	11.2	43,459	16,856	2.6
Mission Bay	22,321	2,698	8.3	64,873	4,426	14.7	20,639	1,709	12.1
Southern Waterfront	81,434	13,385	6.1	184,501	11,023	16.7	114,086	14,486	7.9

[c] Source: vmt_raw_update.csv for 2050 Baseline, SFCTA, April 2021

Year 2050 Baseline plus Plan [d]

Location	Resid. VMT	Population	Resid. VMT per capita	Work VMT	Workers	Work VMT per capita	Retail VMT	Retail Size	Retail VMT per capita
SF Bay Area	145,048,430	8,480,054	17.1	84,167,383	3,538,922	23.8	115,754,186	7,398,972	15.6
SF Bay Area minus 15%			14.5			20.2			13.3
All San Francisco	8,366,965	989,375	8.5	8,424,251	664,530	12.7	8,590,831	1,138,122	7.5
Waterfront Area	127,634	19,249	6.6	606,121	41,465	14.6	311,717	65,557	4.8
Waterfront Subareas									
Fisherman's Wharf	4,377	743	5.9	61,699	3,732	16.5	38,252	14,891	2.6
NE Wtrfrnt / Ferry Bldg.	6,067	900	6.7	125,703	9,089	13.8	56,817	11,363	5.0
So. Beach / China B.	14,277	1,542	9.3	160,581	12,446	12.9	79,876	23,047	3.5
Mission Bay	21,566	2,700	8.0	68,412	4,615	14.8	21,154	1,708	12.4
Southern Waterfront	81,347	13,364	6.1	189,727	11,583	16.4	115,617	14,547	7.9

[d] Source: vmt_raw_update.csv for 2050 plus Plan, SFCTA, April 2021

San Francisco Waterfront Land Use Plan

Average daily VMT per capita - TAZ Level

Location	Year 2020 Baseline [a]			Year 2020 Baseline plus Plan [b]			Year 2050 Baseline [c]			Year 2050 Baseline plus Plan [d]		
	Resid. VMT per capita	Work VMT per capita	Retail VMT per capita	Resid. VMT per capita	Work VMT per capita	Retail VMT per capita	Resid. VMT per capita	Work VMT per capita	Retail VMT per capita	Resid. VMT per capita	Work VMT per capita	Retail VMT per capita
SF Bay Area	18.6	25.7	14.9	18.4	25.5	14.8	17.1	23.8	15.7	17.1	23.8	15.6
SF Bay Area minus 15%	15.8	21.9	12.7	15.7	21.6	12.6	14.5	20.2	13.3	14.5	20.2	13.3
Fisherman's Wharf												
847	5.2	18.5	4.5	5.6	17.5	4.4	5.9	16.7	5.0	5.9	15.8	5.2
851	5.9	18.3	3.5	5.4	18.0	3.7	5.2	16.1	3.9	5.7	17.1	4.0
853	5.6	16.9	3.3	5.3	17.4	3.3	5.4	16.8	3.7	6.0	16.0	3.7
855	5.8	17.3	1.9	5.5	17.2	1.8	5.4	16.5	2.0	5.9	16.2	2.0
NE Waterfront / Ferry Building												
778	8.0	10.7	3.4	8.2	10.8	3.5	9.2	9.4	4.0	9.3	9.7	3.9
808	8.0	10.6	4.4	8.0	10.3	4.2	9.1	9.3	4.9	9.0	9.4	4.8
814	7.8	10.4	4.7	7.7	10.3	4.5	9.0	9.3	5.2	8.8	9.4	5.0
828	6.5	15.2	5.3	6.6	15.2	5.0	6.9	12.8	5.8	7.1	13.2	5.5
829	5.9	16.8	4.5	6.0	16.8	4.5	6.0	14.8	4.9	6.6	14.7	4.8
830	6.8	13.2	4.9	6.7	12.9	4.8	7.5	11.5	5.6	7.3	11.8	5.5
835	5.7	17.7	4.5	5.6	18.4	4.6	5.9	16.0	4.9	6.7	16.1	4.8
854	5.7	17.4	4.0	5.7	18.8	4.3	5.7	16.2	4.4	6.3	16.4	4.5
958	7.8	11.0	4.2	7.6	10.6	3.9	9.0	9.5	4.6	8.7	9.7	4.5
So. Beach / China B.												
633	7.3	15.8	7.9	7.0	15.5	8.1	8.7	13.0	9.0	9.4	12.7	9.1
723	8.1	14.9	6.5	8.3	15.8	5.0	9.7	12.5	7.6	9.6	13.9	6.0
725	7.9	14.1	3.9	8.2	14.8	3.8	9.6	12.6	4.5	9.4	12.7	4.6
762	7.8	11.2	2.4	8.1	11.1	2.3	9.5	9.6	2.8	9.6	10.0	2.8
763	7.8	13.0	3.3	8.1	13.1	3.3	9.6	10.9	4.0	9.6	11.6	4.2
926	6.9	16.4	7.2	6.8	16.6	8.5	8.4	13.4	8.3	9.1	13.5	8.8
Mission Bay												
649	7.5	18.9	9.8	7.2	18.8	9.6	8.3	14.7	9.3	7.0	15.5	9.7
650	6.6	18.5	8.6	6.6	18.3	8.3	8.1	14.5	11.2	7.5	14.7	11.5
655	6.9	18.4	8.2	6.9	18.9	8.1	8.2	14.5	13.2	7.9	14.6	13.5
Southern Waterfront												
444	6.8	25.1	7.8	7.0	24.1	7.9	7.7	22.2	8.6	7.5	22.6	8.1
492	11.0	23.6	10.4	8.7	22.2	9.6	4.0	20.5	10.9	5.6	21.6	10.9
493	7.2	26.9	10.3	7.1	23.7	10.5	8.0	22.7	10.2	6.8	22.8	11.2
521	8.4	20.3	9.8	8.2	20.8	9.8	5.9	16.0	9.0	6.1	15.8	9.3
522	9.1	22.4	12.2	8.7	21.4	12.0	5.9	18.1	12.6	6.1	17.8	12.5
559	8.4	21.5	5.9	8.2	21.5	5.9	6.2	15.9	6.8	6.1	15.2	6.7

Sources:

[a] vmt_wgt_update.csv for 2020 Baseline, SFCTA, April 2021

[b] vmt_wgt_update.csv for 2020 plus Plan, SFCTA, April 2021

[c] vmt_wgt_update.csv for 2050 Baseline, SFCTA, April 2021

[d] vmt_wgt_update.csv for 2050 plus Plan, SFCTA, April 2021

APPENDIX F

Supporting Documentation for Noise Analysis

F1 Traffic Noise Modeling Output

TRAFFIC NOISE ANALYSIS TOOL

Project Name: San Francisco Waterfront Plan
Analysis Scenario: Existing (2020)
Source of Traffic Volumes: LCW Consulting

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
North Point from Powell to Stockton	Hard	50	25	25	25	521	16	11	60.3	60.6
Bay from Embarcadero to Kearny	Hard	50	25	25	25	1,229	39	26	64.0	64.3
Embarcadero from Beach to Northpoint	Hard	50	30	30	30	566	18	12	61.9	62.2
Embarcadero from Green to Vallejo	Hard	50	30	30	30	1,499	47	32	66.1	66.4
Embarcadero from Broadway to Washington	Hard	50	30	30	30	1,996	63	42	67.4	67.7
Mission from Embarcadero to Stueart	Hard	50	25	25	25	316	10	7	58.1	58.4
Embarcadero from Harrison to Bryant	Hard	50	30	30	30	1,669	53	35	66.6	66.9
Bryant from Embarcadero to Main	Hard	50	25	25	25	611	19	13	61.0	61.3
King from 2nd to 3rd	Hard	50	30	30	30	1,981	63	42	67.4	67.7
3rd from Terry Francois to Channel	Hard	50	30	30	30	1,036	33	22	64.5	64.8
3rd from Mission Bay to South	Hard	50	30	30	30	1,349	43	28	65.7	66.0
3rd from 16th to Mariposa	Hard	50	30	30	30	1,621	51	34	66.5	66.8
3rd from 26th to Ceasar Chavez	Hard	50	30	30	30	1,381	44	29	65.8	66.1
Cargo Way from Illinois to Mendell	Hard	50	35	35	35	202	6	4	58.8	59.1
Evans from 3rd to Newhall	Hard	50	35	35	35	944	30	20	65.5	65.8

Model Notes:

The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: San Francisco Waterfront Plan
Analysis Scenario: Existing (2020)+ Project
Source of Traffic Volumes: LCW Consulting

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
North Point from Powell to Stockton	Hard	50	25	25	25	560	18	12	60.6	60.9
Bay from Embarcadero to Kearny	Hard	50	25	25	25	1,404	44	30	64.6	64.9
Embarcadero from Beach to Northpoint	Hard	50	30	30	30	632	20	13	62.4	62.7
Embarcadero from Green to Vallejo	Hard	50	30	30	30	1,719	54	36	66.7	67.0
Embarcadero from Broadway to Washington	Hard	50	30	30	30	2,281	72	48	68.0	68.3
Mission from Embarcadero to Stueart	Hard	50	25	25	25	343	11	7	58.5	58.8
Embarcadero from Harrison to Bryant	Hard	50	30	30	30	1,907	60	40	67.2	67.5
Bryant from Embarcadero to Main	Hard	50	25	25	25	943	30	20	62.8	63.1
King from 2nd to 3rd	Hard	50	30	30	30	2,199	69	46	67.8	68.1
3rd from Terry Francois to Channel	Hard	50	30	30	30	1,288	41	27	65.5	65.8
3rd from Mission Bay to South	Hard	50	30	30	30	1,619	51	34	66.5	66.8
3rd from 16th to Mariposa	Hard	50	30	30	30	1,888	60	40	67.1	67.4
3rd from 26th to Ceasar Chavez	Hard	50	30	30	30	1,596	50	34	66.4	66.7
Cargo Way from Illinois to Mendell	Hard	50	35	35	35	309	10	7	60.7	61.0
Evans from 3rd to Newhall	Hard	50	35	35	35	1,063	34	22	66.1	66.4

Model Notes:

The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: San Francisco Waterfront Plan
Analysis Scenario: Cumulative (2050)
Source of Traffic Volumes: LCW Consulting

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
North Point from Powell to Stockton	Hard	50	25	25	25	731	23	15	61.7	62.0
Bay from Embarcadero to Kearny	Hard	50	25	25	25	1,503	47	32	64.9	65.2
Embarcadero from Beach to Northpoint	Hard	50	30	30	30	832	26	18	63.6	63.9
Embarcadero from Green to Vallejo	Hard	50	30	30	30	2,404	76	51	68.2	68.5
Embarcadero from Broadway to Washington	Hard	50	30	30	30	2,863	90	60	69.0	69.3
Mission from Embarcadero to Stueart	Hard	50	25	25	25	464	15	10	59.8	60.1
Embarcadero from Harrison to Bryant	Hard	50	30	30	30	2,757	87	58	68.8	69.1
Bryant from Embarcadero to Main	Hard	50	25	25	25	1,468	46	31	64.8	65.1
King from 2nd to 3rd	Hard	50	30	30	30	3,557	112	75	69.9	70.2
3rd from Terry Francois to Channel	Hard	50	30	30	30	2,239	71	47	67.9	68.2
3rd from Mission Bay to South	Hard	50	30	30	30	2,500	79	53	68.4	68.7
3rd from 16th to Mariposa	Hard	50	30	30	30	2,357	74	50	68.1	68.4
3rd from 26th to Ceasar Chavez	Hard	50	30	30	30	2,942	93	62	69.1	69.4
Cargo Way from Illinois to Mendell	Hard	50	35	35	35	550	17	12	63.2	63.5
Evans from 3rd to Newhall	Hard	50	35	35	35	1,778	56	37	68.3	68.6

Model Notes:

The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

TRAFFIC NOISE ANALYSIS TOOL

Project Name: San Francisco Waterfront Plan
Analysis Scenario: Cumulative (2050) + Project
Source of Traffic Volumes: LCW Consulting

Roadway Segment	Ground Type	Distance from Roadway to Receiver (feet)	Speed (mph)			Peak Hour Volume			Peak Hour Noise Level (Leq(h) dBA)	Noise Level dBA CNEL
			Auto	MT	HT	Auto	MT	HT		
North Point from Powell to Stockton	Hard	50	25	25	25	770	24	16	62.0	62.3
Bay from Embarcadero to Kearny	Hard	50	25	25	25	1,678	53	35	65.3	65.6
Embarcadero from Beach to Northpoint	Hard	50	30	30	30	898	28	19	63.9	64.2
Embarcadero from Green to Vallejo	Hard	50	30	30	30	2,623	83	55	68.6	68.9
Embarcadero from Broadway to Washington	Hard	50	30	30	30	3,148	99	66	69.4	69.7
Mission from Embarcadero to Stueart	Hard	50	25	25	25	490	15	10	60.0	60.3
Embarcadero from Harrison to Bryant	Hard	50	30	30	30	2,994	95	63	69.1	69.4
Bryant from Embarcadero to Main	Hard	50	25	25	25	1,800	57	38	65.7	66.0
King from 2nd to 3rd	Hard	50	30	30	30	3,775	119	79	70.2	70.5
3rd from Terry Francois to Channel	Hard	50	30	30	30	2,491	79	52	68.3	68.6
3rd from Mission Bay to South	Hard	50	30	30	30	2,770	87	58	68.8	69.1
3rd from 16th to Mariposa	Hard	50	30	30	30	2,624	83	55	68.6	68.9
3rd from 26th to Ceasar Chavez	Hard	50	30	30	30	3,157	100	66	69.4	69.7
Cargo Way from Illinois to Mendell	Hard	50	35	35	35	656	21	14	64.0	64.3
Evans from 3rd to Newhall	Hard	50	35	35	35	1,897	60	40	68.6	68.9

Model Notes:

The calculation is based on the methodology described in FHWA Traffic Noise Model Technical Manual (1998).
The peak hour noise level at 50 feet was validated with the results from FHWA Traffic Noise Model Version 2.5.
Accuracy of the calculation is within ±0.1 dB when comparing to TNM results.
Noise propagation greater than 50 feet is based on the following assumptions:
For hard ground, the propagation rate is 3 dB per doubling the distance.
For soft ground, the propagation rate is 4.5 dB per doubling the distance.
Vehicles are assumed to be on a long straight roadway with cruise speed.
Roadway grade is less than 1.5%.
CNEL levels were obtained based on Figure 2-19, on page 2-58 Caltran's TeNS 2013.

F2 Noise Monitoring Summaries and Output

Summary

File Name on Meter	LxT_Data.094
File Name on PC	SLM_0004435_LxT_Data_094.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.402
User	C. Sanchez
Location	ST-1 Fort Mason East
Job Description	Waterfront Plan
Note	

Measurement

Description	
Start	2021-01-12 11:10:32
Stop	2021-01-12 11:25:42
Duration	00:15:10.4
Run Time	00:15:10.4
Pause	00:00:00.0
Pre Calibration	2021-01-12 10:00:50
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT2B
Microphone Correction	Off
Integration Method	Exponential
Overload	143.3 dB

	A	**C**	**Z**	
Under Range Peak	99.5	96.5	**101.5**	dB
Under Range Limit	**37.9**	37.4	44.2	dB
Noise Floor	28.7	28.3	35.1	dB

Results

LA_{Seq}	64.9		
LASE	94.5		
EAS	316.172	µPa²h	
EAS8	10.002	mPa²h	
EAS40	50.010	mPa²h	
$LZ_{Speak\ (max)}$	2021-01-12 11:18:54	99.0	dB
LAS_{max}	2021-01-12 11:18:54	77.4	dB
LAS_{min}	2021-01-12 11:24:32	46.9	dB
SEA	-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{Seq}	75.3	dB
LA_{Seq}	64.9	dB
LC_{Seq} - LA_{Seq}	10.3	dB
LAI_{eq}	65.6	dB
LA_{eq}	64.9	dB
LAI_{eq} - LA_{eq}	0.7	dB

Record #	Record Type	Date	Time	LASeq	LASmax	LASmin	OVLD	Marker
1	Run	2021-01-12	11:10:31					
2		2021-01-12	11:10:32	61.2	67.3	54.8	No	
3		2021-01-12	11:11:32	68.1	74.0	53.5	No	
4		2021-01-12	11:12:32	66.1	71.9	53.6	No	
5		2021-01-12	11:13:32	67.4	74.1	53.8	No	
6		2021-01-12	11:14:32	62.0	70.1	53.0	No	
7		2021-01-12	11:15:32	70.4	76.1	55.6	No	
8		2021-01-12	11:16:32	62.0	66.7	54.9	No	
9		2021-01-12	11:17:32	61.5	65.4	54.5	No	
10		2021-01-12	11:18:32	68.3	77.4	54.0	No	
11		2021-01-12	11:19:32	66.0	74.0	52.9	No	
12		2021-01-12	11:20:32	60.7	67.8	51.4	No	
13		2021-01-12	11:21:32	58.4	63.1	47.4	No	
14		2021-01-12	11:22:32	58.8	66.4	47.3	No	
15		2021-01-12	11:23:32	57.9	65.3	47.0	No	
16		2021-01-12	11:24:32	57.2	62.0	46.9	No	
17		2021-01-12	11:25:32	57.9	61.2	53.9	No	
18	Stop	2021-01-12	11:25:42					

Summary

File Name on Meter	LxT_Data.093
File Name on PC	SLM_0004435_LxT_Data_093.01.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.402
User	C. Sanchez
Location	ST-2 Aquatic Park
Job Description	Waterfront Plan
Note	

Measurement

Description		
Start	2021-01-12 10:43:29	
Stop	2021-01-12 10:58:31	
Duration	00:15:01.5	
Run Time	00:15:01.5	
Pause	00:00:00.0	
Pre Calibration	2021-01-12 10:00:50	
Post Calibration	None	
Calibration Deviation	---	

Overall Settings

RMS Weight	A Weighting	
Peak Weight	Z Weighting	
Detector	Slow	
Preamp	PRMLxT2B	
Microphone Correction	Off	
Integration Method	Exponential	
Overload	143.3	dB

	A	**C**	**Z**	
Under Range Peak	99.5	96.5	**101.5**	dB
Under Range Limit	**37.9**	37.4	44.2	dB
Noise Floor	28.7	28.3	35.1	dB

Results

LA_{Seq}	55.2		
LASE	84.7		
EAS	33.007	µPa²h	
EAS8	1.054	mPa²h	
EAS40	5.272	mPa²h	
$LZ_{Speak\ (max)}$	2021-01-12 10:43:42	89.2	dB
LAS_{max}	2021-01-12 10:55:40	74.6	dB
LAS_{min}	2021-01-12 10:54:36	47.0	dB
SEA	-99.9	dB	

LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0 s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0 s
LZ_{Speak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0 s

LC_{Seq}	64.9	dB
LA_{Seq}	55.2	dB
LC_{Seq} - LA_{Seq}	9.7	dB
LAI_{eq}	60.5	dB
LA_{eq}	55.2	dB
LAI_{eq} - LA_{eq}	5.3	dB

Record #	Record Type	Date	Time	LASeq	LASmax	LASmin	OVLD	Marker
1	Run	2021-01-12	10:43:29					
2		2021-01-12	10:43:29	51.2	56.9	47.5	No	
3		2021-01-12	10:44:29	51.1	57.9	48.2	No	
4		2021-01-12	10:45:29	51.7	62.3	48.7	No	
5		2021-01-12	10:46:29	55.0	62.7	48.9	No	
6		2021-01-12	10:47:29	52.7	58.6	48.6	No	
7		2021-01-12	10:48:29	51.6	54.3	48.5	No	
8		2021-01-12	10:49:29	51.1	56.6	48.3	No	
9		2021-01-12	10:50:29	50.4	53.2	48.0	No	
10		2021-01-12	10:51:29	52.7	58.8	48.7	No	
11		2021-01-12	10:52:29	51.0	54.6	48.1	No	
12		2021-01-12	10:53:29	49.9	60.0	47.3	No	
13		2021-01-12	10:54:29	55.0	66.6	47.0	No	
14		2021-01-12	10:55:29	63.5	74.6	49.7	No	
15		2021-01-12	10:56:29	56.9	67.7	50.1	No	
16		2021-01-12	10:57:29	53.5	59.2	47.4	No	
17		2021-01-12	10:58:29	48.9	49.5	48.5	No	
18	Stop	2021-01-12	10:58:31					

Summary

File Name on Meter	LxT_Data.092
File Name on PC	SLM_0004435_LxT_Data_092.00.ldbin
Serial Number	0004435
Model	SoundTrack LxT®
Firmware Version	2.402
User	C. Sanchez
Location	ST-3 Beach b/w Leavenworth and Jones
Job Description	Waterfront Plan
Note	

Measurement

Description	
Start	2021-01-12 10:05:50
Stop	2021-01-12 10:21:02
Duration	00:15:11.7
Run Time	00:15:11.7
Pause	00:00:00.0
Pre Calibration	2021-01-12 10:00:50
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting			
Peak Weight	Z Weighting			
Detector	Slow			
Preamp	PRMLxT2B			
Microphone Correction	Off			
Integration Method	Exponential			
Overload	143.3 dB			
	A		**C**	**Z**
Under Range Peak	99.5		96.5	**101.5** dB
Under Range Limit	**37.9**		37.4	44.2 dB
Noise Floor	28.7		28.3	35.1 dB

Results

LA_{Seq}	62.4		
LASE	92.0		
EAS	177.448 µPa²h		
EAS8	5.605 mPa²h		
EAS40	28.027 mPa²h		
$LZ_{Speak\ (max)}$	2021-01-12 10:12:52	101.9	dB
LAS_{max}	2021-01-12 10:07:26	82.6	dB
LAS_{min}	2021-01-12 10:20:07	47.6	dB
SEA	-99.9 dB		
LAS > 85.0 dB (Exceedance Counts / Duration)	0	0.0	s
LAS > 115.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{Speak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{Speak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{Speak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s
LC_{Seq}	69.7 dB		
LA_{Seq}	62.4 dB		
LC_{Seq} - LA_{Seq}	7.3 dB		
LAI_{eq}	64.1 dB		
LA_{eq}	62.4 dB		
LAI_{eq} - LA_{eq}	1.7 dB		

Record #	Record Type	Date	Time	LASeq	LASmax	LASmin	OVLD	Marker
1	Run	2021-01-12	10:05:50					
2		2021-01-12	10:05:50	63.8	73.2	61.9	No	
3		2021-01-12	10:06:50	71.5	82.6	57.0	No	
4		2021-01-12	10:07:50	59.8	71.0	48.8	No	
5		2021-01-12	10:08:50	58.8	68.4	49.3	No	
6		2021-01-12	10:09:50	52.7	63.3	47.9	No	
7		2021-01-12	10:10:50	61.6	70.6	48.7	No	
8		2021-01-12	10:11:50	63.7	75.6	50.1	No	
9		2021-01-12	10:12:50	59.0	67.1	50.8	No	
10		2021-01-12	10:13:50	60.1	69.2	50.1	No	
11		2021-01-12	10:14:50	58.1	64.5	48.7	No	
12		2021-01-12	10:15:50	55.8	63.8	50.7	No	
13		2021-01-12	10:16:50	60.6	71.0	50.2	No	
14		2021-01-12	10:17:50	54.4	69.4	47.7	No	
15		2021-01-12	10:18:50	49.8	55.7	47.7	No	
16		2021-01-12	10:19:50	49.5	55.1	47.6	No	
17		2021-01-12	10:20:50	55.7	57.5	52.3	No	
18	Stop	2021-01-12	10:21:02					

Calculated Ldn from long-term noise monitoring data Cargo Way at 3rd Street (LT-13)

		TIME		dBA	Remove LOG	10 dBA Penalty	5 dBA Penalty	
1/13/2021	Midnight	0 / 24		65.9	3861286	38612863	12210459	**Leq Morning Peak Hour 7:00-10:00 a.m.**
	am	1:00	100	65.9	3895884	38958838	12319866	**71** dBA
		2:00	200	64.8	3011952	30119517	9524628	
		3:00	300	68.6	7181150	71811500	22708790	**Leq Evening Peak Hour 4:00-8:00 p.m.**
		4:00	400	69.7	9391522	93915224	29698602	**69** dBA
		5:00	500	69.3	8452827	84528274	26730187	
		6:00	600	69.9	9754432	97544323	30846223	**Leq Nighttime 10:00 pm-7:00 a.m. (not penalized)**
		7:00	700	70.5	11137379	111373790	35219485	**68** dBA
		8:00	800	70.6	11356984	113569836	35913936	
		9:00	900	70.6	11408538	114085382	36076965	**Leq Daytime 7:00 am-10:00 p.m.**
		10:00	1000	69.9	9729690	97296899	30767981	**70** dBA
		11:00	1100	71.4	13896582	138965822	43944851	
		12:00	1200	70.1	10160568	101605683	32130538	**Leq 24-Hour**
	pm	1:00	1300	69.8	9519782	95197819	30104194	**69** dBA
		2:00	1400	70.8	12039432	120394321	38072027	
		3:00	1500	70.9	12233733	122337331	38686461	**Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.**
		4:00	1600	68.3	6814783	68147825	21550234	**75** dBA
		5:00	1700	69.8	9585792	95857920	30312936	
		6:00	1800	67.6	5790059	57900591	18309775	**CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m.,**
		7:00	1900	68.0	6370287	63702870	20144616	**75** dBA **and 10 dBA penalty for noise between**
		8:00	2000	68.5	7057486	70574856	22317729	**10:00 p.m. and 7:00 a.m.**
		9:00	2100	66.6	4553601	45536013	14399752	
		10:00	2200	65.5	3515928	35159282	11118341	
	pm	11:00	2300	66.8	4784946	47849455	15131326	CNEL - Ldn : 0.24142608

Summary

File Name on Meter	831_Data.041
File Name on PC	SLM_0002783_831_Data_041.00.ldbin
Serial Number	0002783
Model	Model 831
Firmware Version	2.402
User	C. Sanchez
Location	LT-13 Cargo way
Job Description	Waterfront Plan
Note	

Measurement

Description	
Start	2021-01-12 10:00:00
Stop	2021-01-14 09:28:47
Duration	47:28:47.703
Run Time	47:28:47.703
Pause	00:00:00.0
Pre Calibration	2021-01-12 09:15:49
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRM831
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	Bin Max
Gain	20.0 dB
Overload	124.5 dB

	A	**C**	**Z**	
Under Range Peak	57.1	54.1	**59.1**	dB
Under Range Limit	**24.8**	25.4	33.1	dB
Noise Floor	15.6	16.3	21.5	dB

Results

L_{Aeq}	70.1		
LAE	122.4		
EA	192.396	mPa^2h	
$LZ_{peak\ (max)}$	2021-01-13 21:11:25	124.8	dB
LAS_{max}	2021-01-12 13:56:49	106.1	dB
LAS_{min}	2021-01-13 02:47:02	48.0	dB
SEA	137.8	dB	
LAS > 65.0 dB (Exceedance Counts / Duration)	3016	87447.7	s
LAS > 85.0 dB (Exceedance Counts / Duration)	147	469.1	s
LZ_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**
	74.8	71.0	67.7	75.0	71.6	67.2

L_{Ceq}	77.3	dB
L_{Aeq}	70.1	dB
L_{Ceq} - L_{Aeq}	7.3	dB
LAI_{eq}	72.7	dB
L_{Aeq}	70.1	dB
LAI_{eq} - L_{Aeq}	2.6	dB

Record #	Record Type	Date	Time	LAeq	LApeak	LZpeak	LA2.00	LA8.00	LA25.00	LA50.00	LA66.60	LA90.00	OVLD
1	Calibration Change	2021-01-12	9:15:49										
2	Run	2021-01-12	10:00:00										
3		2021-01-12	10:00:00	74.8	113.7	119.0	79.4	75.2	71.6	68.5	67.0	63.9	No
4		2021-01-12	11:00:00	77.0	115.5	117.2	84.1	77.0	71.5	68.1	66.2	62.5	No
5		2021-01-12	12:00:00	69.4	102.3	105.4	77.3	72.1	68.0	65.2	63.7	61.2	No
6		2021-01-12	13:00:00	77.8	117.4	116.0	80.0	74.1	69.1	66.3	64.8	62.1	No
7		2021-01-12	14:00:00	69.0	105.7	111.8	77.2	72.5	68.1	64.9	63.4	61.2	No
8		2021-01-12	15:00:00	69.3	107.3	109.9	77.8	72.7	67.9	64.8	63.3	60.8	No
9		2021-01-12	16:00:00	69.8	109.4	113.0	78.2	73.1	67.5	64.7	63.3	60.6	No
10		2021-01-12	17:00:00	67.9	102.2	106.3	75.5	71.3	67.0	64.6	63.6	62.0	No
11		2021-01-12	18:00:00	68.7	101.4	107.0	78.3	71.9	65.6	63.1	62.0	60.7	No
12		2021-01-12	19:00:00	67.7	103.4	109.3	77.4	70.1	65.0	61.6	60.2	56.5	No
13		2021-01-12	20:00:00	67.3	102.9	108.4	76.6	69.8	63.8	60.1	57.9	54.6	No
14		2021-01-12	21:00:00	63.9	97.9	103.2	73.0	66.9	60.9	56.9	54.8	52.2	No
15		2021-01-12	22:00:00	65.2	105.8	108.3	74.4	68.3	61.6	57.8	55.9	53.5	No
16		2021-01-12	23:00:00	66.6	104.0	106.2	75.1	67.4	63.0	61.4	61.0	60.3	No
17		2021-01-13	0:00:00	65.9	103.6	105.5	74.2	68.1	63.1	61.4	60.9	60.0	No
18		2021-01-13	1:00:00	65.9	99.6	111.0	74.9	67.9	61.8	60.0	59.2	56.8	No
19		2021-01-13	2:00:00	64.8	106.6	108.8	74.1	67.4	61.2	55.8	53.0	50.4	No
20		2021-01-13	3:00:00	68.6	111.3	116.5	78.6	71.7	63.4	58.2	55.4	52.1	No
21		2021-01-13	4:00:00	69.7	104.7	111.3	79.6	72.0	65.1	60.6	58.4	54.8	No
22		2021-01-13	5:00:00	69.3	104.1	106.8	78.8	72.2	66.9	63.8	62.9	57.8	No
23		2021-01-13	6:00:00	69.9	102.5	106.4	78.3	73.3	68.8	65.8	64.6	63.0	No
24		2021-01-13	7:00:00	70.5	107.3	107.1	77.9	73.7	69.9	67.3	66.1	63.7	No
25		2021-01-13	8:00:00	70.6	103.5	105.4	79.2	73.7	69.3	66.7	65.1	61.9	No
26		2021-01-13	9:00:00	70.6	108.1	109.6	78.7	74.3	70.3	67.2	65.5	62.9	No
27		2021-01-13	10:00:00	69.9	105.4	105.6	77.9	73.5	69.8	66.7	65.1	62.0	No
28		2021-01-13	11:00:00	71.4	108.9	109.5	78.7	73.8	69.7	66.3	64.5	61.7	No
29		2021-01-13	12:00:00	70.1	112.8	118.6	77.9	73.6	69.3	66.7	65.1	62.6	No
30		2021-01-13	13:00:00	69.8	109.3	109.1	78.0	73.0	69.1	66.5	65.2	63.1	No
31		2021-01-13	14:00:00	70.8	106.7	112.7	79.5	73.7	68.8	65.2	63.8	61.1	No
32		2021-01-13	15:00:00	70.9	108.7	108.4	78.0	73.3	68.2	65.1	63.6	60.8	No
33		2021-01-13	16:00:00	68.3	106.5	108.6	75.8	71.9	67.7	64.8	63.2	60.7	No
34		2021-01-13	17:00:00	69.8	109.8	110.9	78.3	73.0	67.1	64.0	62.5	59.6	No
35		2021-01-13	18:00:00	67.6	101.8	104.2	77.3	71.3	65.5	62.5	61.0	58.4	No
36		2021-01-13	19:00:00	68.0	105.9	107.6	77.1	70.8	65.6	61.8	60.0	56.9	No
37		2021-01-13	20:00:00	68.5	116.5	119.2	77.8	70.2	64.4	60.2	58.2	55.1	No
38		2021-01-13	21:00:00	66.6	123.6	124.8	73.2	67.1	63.2	61.2	60.5	56.4	Yes
39		2021-01-13	22:00:00	65.5	103.8	105.1	73.6	68.2	63.1	61.3	60.7	60.0	No
40		2021-01-13	23:00:00	66.8	100.2	107.4	76.2	67.7	63.1	61.4	61.0	60.3	No
41		2021-01-14	0:00:00	66.1	102.9	105.7	74.5	67.8	63.3	61.3	60.8	60.1	No
42		2021-01-14	1:00:00	67.2	105.6	110.3	75.5	69.1	63.5	61.3	60.7	60.0	No
43		2021-01-14	2:00:00	65.6	98.6	104.0	75.9	68.3	62.5	58.4	55.7	53.0	No
44		2021-01-14	3:00:00	67.9	100.9	107.1	78.3	71.4	64.5	59.4	57.1	54.0	No
45		2021-01-14	4:00:00	69.0	108.6	109.0	78.7	71.2	64.4	59.7	57.4	54.6	No
46		2021-01-14	5:00:00	69.2	106.1	110.9	78.9	72.7	67.4	63.5	60.7	57.0	No
47		2021-01-14	6:00:00	70.2	100.8	106.0	78.6	74.2	69.5	66.3	65.1	63.6	No
48		2021-01-14	7:00:00	70.9	102.2	109.2	78.0	74.8	71.0	68.1	66.8	64.5	No
49		2021-01-14	8:00:00	70.3	108.4	109.1	77.8	73.6	69.2	66.5	65.0	62.7	No
50		2021-01-14	9:00:00	71.1	118.2	119.0	78.7	75.2	70.6	67.6	66.2	63.8	No
51	Stop	2021-01-14	9:28:47										

Calculated Ldn from long-term noise monitoring data (LT-15)

		TIME		dBA	Remove LOG	10 dBA Penalty	5 dBA Penalty
1/15/2021	Midnight		0 / 24	58.9	771918	7719177	2441018
	am	1:00	100	54.5	283569	2835685	896722
		2:00	200	53.8	241826	2418260	764721
		3:00	300	56.6	451991	4519912	1429322
		4:00	400	55.5	355576	3555765	1124431
		5:00	500	62.3	1698576	16985761	5371369
		6:00	600	64.8	3009803	30098025	9517831
		7:00	700	65.4	3494138	34941376	11049433
		8:00	800	65.9	3866901	38669005	12228213
		9:00	900	66.5	4484345	44843448	14180743
		10:00	1000	66.6	4563920	45639198	14432381
		11:00	1100	68.5	7052028	70520275	22300469
		12:00	1200	69.3	8603556	86035562	27206834
	pm	1:00	1300	67.6	5787940	57879397	18303073
1/14/2021		2:00	1400	68.4	6968078	69680779	22034997
		3:00	1500	67.0	5003674	50036739	15823006
		4:00	1600	66.1	4102022	41020221	12971733
		5:00	1700	66.3	4267780	42677798	13495905
		6:00	1800	65.6	3611437	36114366	11420365
		7:00	1900	64.3	2722444	27224443	8609125
		8:00	2000	63.4	2181534	21815341	6898616
		9:00	2100	62.3	1710846	17108463	5410171
		10:00	2200	60.3	1075645	10756451	3401488
	pm	11:00	2300	70.5	11333786	113337858	35840578

Leq Morning Peak Hour 7:00-10:00 a.m.
66 dBA

Leq Evening Peak Hour 4:00-8:00 p.m.
66 dBA

Leq Nighttime 10:00 pm-7:00 a.m. (not penalized)
63 dBA

Leq Daytime 7:00 am-10:00 p.m.
67 dBA

Leq 24-Hour
66 dBA

Ldn: 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.
70 dBA

CNEL: 5 dBA penalty for noise between 7:00p.m. and 10:00 p.m.,
71 dBA **and 10 dBA penalty for noise between 10:00 p.m. and 7:00 a.m.**

CNEL - Ldn = 0.23201085

Summary

File Name on Meter	831_Data.042
File Name on PC	SLM_0002783_831_Data_042.00.ldbin
Serial Number	0002783
Model	Model 831
Firmware Version	2.402
User	C. Sanchez
Location	LT-15
Job Description	Waterfront Plan
Note	

Measurement

Description	
Start	2021-01-14 10:00:00
Stop	2021-01-15 13:47:06
Duration	27:47:06.203
Run Time	27:47:06.203
Pause	00:00:00.0
Pre Calibration	2021-01-12 09:15:46
Post Calibration	None
Calibration Deviation	---

Overall Settings

RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRM831
Microphone Correction	Off
Integration Method	Linear
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	A Weighting
OBA Max Spectrum	Bin Max
Gain	20.0 dB
Overload	124.5 dB

	A	**C**	**Z**	
Under Range Peak	57.1	54.1	**59.1**	dB
Under Range Limit	**24.8**	25.4	33.1	dB
Noise Floor	15.6	16.3	21.5	dB

Results

LA_{eq}	65.7		
LAE	115.7		
EA	41.752	mPa^2h	
$LZ_{peak\ (max)}$	2021-01-14 14:16:09	125.0	dB
LAS_{max}	2021-01-14 23:22:46	103.6	dB
LAS_{min}	2021-01-15 00:17:47	38.3	dB
SEA	135.0	dB	
LAS > 65.0 dB (Exceedance Counts / Duration)	2824	26351.5	s
LAS > 85.0 dB (Exceedance Counts / Duration)	14	45.6	s
LZ_{peak} > 135.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{peak} > 137.0 dB (Exceedance Counts / Duration)	0	0.0	s
LZ_{peak} > 140.0 dB (Exceedance Counts / Duration)	0	0.0	s

Community Noise	**Ldn**	**LDay 07:00-22:00**	**LNight 22:00-07:00**	**Lden**	**LDay 07:00-19:00**	**LEvening 19:00-22:00**
	70.4	66.5	63.3	70.6	67.0	63.4

LC_{eq}	71.8	dB
LA_{eq}	65.7	dB
LC_{eq} - LA_{eq}	6.1	dB
LAI_{eq}	69.0	dB
LA_{eq}	65.7	dB
LAI_{eq} - LA_{eq}	3.2	dB

Record #	Record Type	Date	Time	LAeq	LApeak	LZpeak	LA2.00	LA8.00	LA25.00	LA50.00	LA66.60	LA90.00	OVLD
1	Run	2021-01-14	10:00:00										
2		2021-01-14	10:00:00	66.1	107.0	107.0	74.5	71.4	66.2	58.1	52.1	46.9	No
3		2021-01-14	11:00:00	66.7	103.0	106.8	74.7	71.7	67.2	59.6	54.3	47.9	No
4		2021-01-14	12:00:00	66.1	96.9	103.1	74.1	71.3	67.0	60.6	54.9	47.3	No
5		2021-01-14	13:00:00	67.3	104.8	109.2	75.0	71.8	66.9	59.8	54.0	46.5	No
6		2021-01-14	14:00:00	68.4	121.7	125.0	75.5	72.0	67.2	60.5	54.5	46.6	Yes
7		2021-01-14	15:00:00	67.0	98.6	104.6	74.8	71.8	67.6	61.9	57.1	48.7	No
8		2021-01-14	16:00:00	66.1	103.3	104.5	73.8	71.1	67.4	61.1	56.0	49.0	No
9		2021-01-14	17:00:00	66.3	98.0	118.9	73.9	71.2	67.3	61.5	56.6	50.3	No
10		2021-01-14	18:00:00	65.6	98.0	106.5	73.8	70.7	66.1	59.6	55.2	50.8	No
11		2021-01-14	19:00:00	64.3	95.7	116.0	72.9	69.9	64.4	56.2	52.6	49.2	No
12		2021-01-14	20:00:00	63.4	97.2	107.2	72.4	69.1	62.3	53.4	48.9	46.4	No
13		2021-01-14	21:00:00	62.3	105.2	106.0	72.3	67.9	58.1	48.5	46.8	45.4	No
14		2021-01-14	22:00:00	60.3	94.5	99.5	71.0	65.7	54.0	47.6	46.1	44.8	No
15		2021-01-14	23:00:00	70.5	113.9	112.8	70.9	63.5	51.7	45.9	44.9	43.7	No
16		2021-01-15	0:00:00	58.9	95.4	101.1	70.1	63.2	49.3	43.5	42.2	40.5	No
17		2021-01-15	1:00:00	54.5	89.6	91.5	65.5	54.5	48.1	44.7	43.7	42.6	No
18		2021-01-15	2:00:00	53.8	93.9	95.6	63.7	52.4	46.2	44.9	44.4	43.7	No
19		2021-01-15	3:00:00	56.6	97.2	102.1	64.9	52.8	47.2	46.1	45.6	44.8	No
20		2021-01-15	4:00:00	55.5	92.6	102.7	65.3	51.6	46.9	46.0	45.5	44.6	No
21		2021-01-15	5:00:00	62.3	94.7	99.1	72.5	67.5	56.1	48.2	46.9	45.6	No
22		2021-01-15	6:00:00	64.8	100.8	105.3	74.0	70.1	62.7	52.4	48.8	46.5	No
23		2021-01-15	7:00:00	65.4	104.9	106.4	74.2	70.9	65.1	56.3	51.7	47.8	No
24		2021-01-15	8:00:00	65.9	99.4	103.0	74.5	71.4	66.4	58.5	52.6	47.6	No
25		2021-01-15	9:00:00	66.5	106.3	107.1	73.9	71.0	66.1	58.7	52.9	47.1	No
26		2021-01-15	10:00:00	66.6	97.0	101.0	74.8	71.9	67.3	60.3	54.8	46.9	No
27		2021-01-15	11:00:00	68.5	106.6	113.3	75.7	72.2	68.1	61.7	56.4	49.0	No
28		2021-01-15	12:00:00	69.3	112.9	118.7	75.5	71.9	67.9	62.2	57.0	49.0	No
29		2021-01-15	13:00:00	67.6	115.6	116.2	75.4	72.2	68.2	61.6	56.7	49.2	No

APPENDIX G

Waterfront Plan Air Quality Technical Memorandum and Health Risk Assessment

ESA

550 Kearny Street
Suite 800
San Francisco, CA 94108
415.896.5900 phone
415.896.0332 fax

esassoc.com

Technical Memorandum

date January 18, 2022

to Jessica Range, San Francisco Planning Department

from Brian Schuster, Cheri Velzy, and Sarah Patterson, ESA

subject Waterfront Plan Air Quality Technical Memorandum and Health Risk Assessment

1. Introduction

1.1 Project Understanding

The Port of San Francisco's 2019 Waterfront Plan (Plan) would update and amend the 1997 Waterfront Land Use Plan, which sets long-term goals and policies to guide the use, management, and improvement of 7.5 miles of properties under the Port's jurisdiction, from Fisherman's Wharf to India Basin. The 1997 Plan was developed pursuant to Proposition H, approved by San Francisco voters in 1990, and was adopted by the Port Commission in 1997. The goals and policies in the 1997 Plan have guided the development of new parks, maritime facilities, historic rehabilitation and development projects on Port properties.

In 2015, the Port conducted a comprehensive review and identified changes in conditions and the need to update the 1997 Plan. This led to a three-year public planning process led by a Waterfront Plan Working Group, which produced policy recommendations to be reflected in the updated Waterfront Plan. In June 2019, the Port published the Draft Waterfront Plan for Public Review and Comment, which incorporates those policy recommendations along with other updates to recognize and align with City policies, evolving public trust needs, and land use changes on Port property. Based on public comments received on the June 2019 draft, the Port republished the Plan in December 2019 with minor revisions. The 2019 Plan provides a long-range policy framework to guide future Port improvement projects, programs, and stewardship initiatives.

Future improvements along the Port's waterfront are guided by nine goals, each of which are supported by policies that provide direction for managing and improving the waterfront throughout its jurisdiction. Goals and policies include but are not limited to preservation and enhancement of the waterfront's function as a maritime port, hosting a diversity of activities and people, enhancing public access and open space along the waterfront, the design of quality new development and preservation of the waterfront's historic character, strengthening the Port's resilience to climate change impacts, and cultivating an environmentally sustainable port to limit the impacts of climate change.

The Port of San Francisco's waterfront extends along 7.5 miles of San Francisco Bay. The Plan area is generally bounded to the north by Hyde Street Pier and Jefferson Street in Fisherman's Wharf, and includes piers and upland properties adjacent to The Embarcadero including Oracle Ballpark; piers and waterfront properties adjacent to Terry Francois Boulevard in Mission Bay; and properties generally east of Illinois Street south of Mission Bay to Cargo Way in India Basin. The Waterfront Plan divides the waterfront into the Northern Waterfront and Southern Waterfront, with five subareas: Fisherman's Wharf, Northeast Waterfront, South Beach, Mission Bay, and Southern Waterfront.

All five subareas are located within the Air Pollutant Exposure Zone (APEZ),[1] which is designated by the San Francisco Department of Public Health (health department) as an area with poor air quality (health department, San Francisco Planning Department 2020). In addition, there are sensitive receptors located within 1,000 meters of each subarea that are also located in the APEZ. The Plan location is shown in **Figure 1**.

1.2 Memorandum Purpose

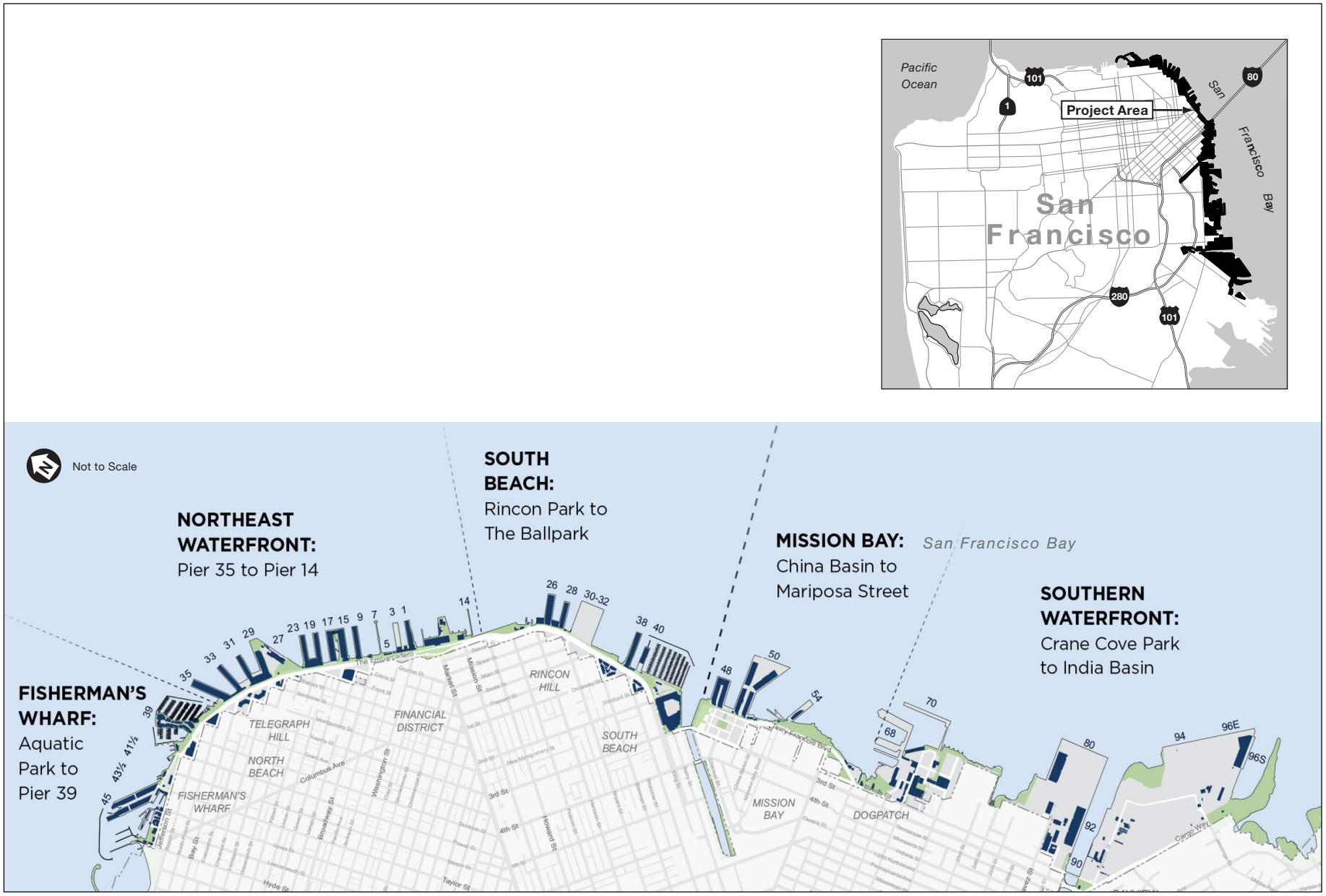
Operation of the Plan would result in criteria pollutant emissions and potential risk to human health from exposure to toxic air contaminant (TAC) emissions. This air quality technical memorandum estimates potential health risks resulting from changes in travel demand and vehicle miles traveled (VMT) associated with implementation of the Plan.

This memorandum presents an existing plus plan health risk assessment (HRA) that estimates lifetime excess cancer risk and annual average $PM_{2.5}$ concentrations that are attributable to other mobile and stationary sources as calculated in the 2020 Citywide Health Risk Assessment (Citywide HRA), in addition to effects from the Plan.

1.3 Memorandum Organization

This memorandum is organized into three sections. Section 1, *Introduction*, summarizes the Waterfront Plan, the purpose of the memorandum, and the memorandum organization. Section 2, *Modeling Inputs*, details the emissions modeling methods and assumptions used to generate the results. Section 3, *Uncertainties*, discusses critical uncertainties associated with the air quality analysis. Analysis results are provided in Section 4, *Results*.

[1] In an effort to identify areas of San Francisco most adversely affected by sources of toxic air contaminants, San Francisco partnered with the Bay Area Air Quality Management District to inventory and assess air pollution and exposures from mobile, stationary, and area sources within San Francisco. Areas with poor air quality, termed the "Air Pollutant Exposure Zone," were identified based on the following health-protective criteria: (1) excess cancer risk greater than 100 per 1 million population from the contribution of emissions from all modeled sources, or (2) cumulative annual average $PM_{2.5}$ concentrations greater than 10 $\mu g/m^3$. An additional health vulnerability layer was incorporated in the APEZ for those San Francisco ZIP codes in the worst quintile of Bay Area Health Vulnerability scores (ZIP Codes 94102, 94103, 94105, 94124, and 94130). In these areas, the standard for identifying areas as being within the zone were lowered to (1) cumulative annual average $PM_{2.5}$ exhaust concentrations greater than 9 $\mu g/m^3$; and/or (2) excess cancer risk from the contribution of emissions from all modeled sources greater than 90 per 1 million population. Finally, all receptors within 500 feet of a freeway are within the APEZ.



SOURCE: Port of San Francisco, Waterfront Plan, June 2019

Waterfront Plan Update

FIGURE 1

WATERFRONT PLAN SUBAREAS

2. Modeling Inputs

2.1 Operational Emissions Modeling

On-Road Mobile Sources

The proposed Plan would accommodate additional growth that would generate vehicle trips. Growth assumptions for the Plan were developed based in part upon estimated land use and growth assumptions developed by the planning department in collaboration with the Port Planning staff based upon leasing, development, and waterfront improvements that could occur under the proposed Waterfront Plan. The travel demand memorandum[2] analyzed roadway segments for each of the five subareas noted above and provided data for the two roadway segments per subarea showing the greatest increase in vehicle trips under the Plan. This information was used to assess localized health risks for three of the subareas with the greatest increase in plan traffic: south beach, mission bay and southern waterfront subareas. The travel demand memorandum included total daily vehicle trips and VMT for four scenarios: 2020 Existing, 2020 Existing plus Plan, 2050 Baseline, and 2050 Baseline plus Plan using the San Francisco County Transportation Authority's (SFCTA) SF-CHAMP travel demand forecasting model.

Total on-road mobile source TAC emissions associated with Plan traffic were calculated using the difference between the 2020 existing and the 2020 existing plus Plan scenario from the travel demand memorandum. However, development that could occur pursuant to the Plan would not be built out in 2020. The earliest anticipated date for construction to occur under the Plan would be approximately 2024 or 2025. Other subsequent development projects would be constructed thereafter and would likely continue beyond 2030. Therefore, a full buildout year of 2030 was conservatively assumed.

Plan traffic were evaluated using the CARB 2021 EMission FACtor (EMFAC2021) model, using the vehicle fleet mix in San Francisco County and year 2030 factors.

Vehicle Fleet and Vehicle Volumes

To estimate the default vehicle split percentage that would be associated with Plan traffic segments, the EMFAC2021 emissions inventory model output for San Francisco County in the year 2030 was used. EMFAC2021 organizes vehicles by category, as noted in **Table 1**, and fuel type (diesel, electricity, natural gas, gasoline, plug-in hybrid). For the Southern Waterfront subarea, it is assumed that trucks would make up a greater percentage of the vehicle fleet because this area largely includes industrial and warehouse uses, and these uses would generate a greater number of heavy-duty trucks than the average vehicle fleet for San Francisco County. Based on weekday vehicle count data[3] for Jerrold Avenue East of Rankin Street (between Rankin and Phelps streets), an average of 8.1 percent trucks was assumed for the Southern Waterfront subarea. To calculate the vehicle split percentage for the Southern Waterfront subarea, the default vehicle split percentage was adjusted by increasing the default county-wide heavy-heavy-duty truck (HHDT) percentage from 1.3 percent to 8.1 percent and reducing all other vehicle type percentages proportionally based on VMT. As a result, the average emission factors used in the Southern Waterfront subarea are generally higher than those factors used in the other four subareas. The default and revised fleet mix by vehicle category are shown in Table 1.

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2 Adavant Consulting and LCW Consulting, *Waterfront Plan EIR – Estimation of Proposed Project Travel Demand, Draft February 18, 2021; Final TBD*, 2021.

3 Ibid.

TABLE 1
VEHICLE SPLIT AND DAILY VMT INCREASE BY VEHICLE CATEGORY

Vehicle Category	EMFAC2021 Default Fleet Mix for 2030[a]	Southern Waterfront Fleet Mix[b]
Heavy-Heavy-Duty 33,001–6,0000 lbs. (HHDT)	1.3%	8.1%
Passenger Cars (LDA)	50.5%	47.1%
Light-Duty Trucks 0–3,750 lbs. (LDT1)	3.4%	3.2%
Light-Duty Trucks 3,751–5,750 lbs. (LDT2)	24.2%	22.5%
Light-Heavy Duty 8,501–10,000 lbs. (LHDT1)	2.9%	2.7%
Light-Heavy Duty 10,001–14,000 lbs. (LHDT2)	0.7%	0.7%
Motorcycles (MCY)	0.5%	0.4%
Medium-Duty Trucks 14,001–33,000 lbs. (MDV)	13.2%	12.3%
Motor Homes (MH)	0.05%	0.05%
Medium-Heavy-Duty (MHDT)	1.7%	1.6%
Other Buses (OBUS)	0.5%	0.5%
School Buses (SBUS)	0.1%	0.1%
Urban Buses (UBUS)	0.8%	0.7%
Total	***100%***	***100%***

SOURCES: EMFAC2021; ESA 2021.

ABBREVIATIONS:

EMFAC2021 = EMission FACtors model version 2021; lbs. = pounds

NOTES:

[a] For San Francisco County; applied to both South Beach and Mission Bay subareas

[b] Adjusted to account for an average of 8.1 percent HHDT.

[c] Based on the Travel Demand Memorandum for the Plan.

The daily vehicle volumes for the model roadway segments by vehicle category are shown in **Table 2**. Emissions from each roadway segment were calculated by utilizing EMFAC2021 emission factors (grams per mile) for each vehicle type and fuel type and applying the daily increase in vehicle volumes and modeled roadway lengths (miles).

Vehicle Emission Factors

Plan traffic TAC emissions for two roadway segments in the three subareas modeled in the HRA were evaluated using EMFAC2021 for the vehicle fleet mix in San Francisco County, or adjusted by truck percentages in the Southern Waterfront area as discussed above and calculated using **Equation 1**.

Equation 1: $$E_{road\ segment} = \sum_{i} (Activity_i * EF_i * Distance_i) * Conv$$

Where

$E_{road\ segment}$ = Total emissions for the modeled road segment, pounds per day

Activity = Vehicle trips, average trips per day (travel demand memorandum)

Distance = Roadway segment length, miles (modeled distance)

TABLE 2
DAILY VEHICLE VOLUME INCREASE BY VEHICLE CATEGORY BY ROADWAY

	South Beach Subarea[a]		Mission Bay Subarea[a]		Southern Waterfront Subarea[b]	
Vehicle Category	**Embarcadero (Harrison St.–Bryant St.)[c]**	**Bryant St. (The Emb.–Main St.)[c]**	**Third St. (Mission Bay Blvd. North–South)[c]**	**Third St. (16th St.–Mariposa St.)[c]**	**Third St. (26th St.–C. Chavez St.)[c]**	**Evans Ave. (Third St.–Newhall St.)[c]**
Heavy-Heavy-Duty 33,001–6,0000 lbs. (HHDT)	41	69	62	62	279	155
Passenger Cars (LDA)	1,607	2,709	2,421	2,446	1,619	899
Light-Duty Trucks 0–3,750 lbs. (LDT1)	109	184	165	166	110	61
Light-Duty Trucks 3,751–5,750 lbs. (LDT2)	769	1,297	1,159	1,171	775	430
Light-Heavy Duty 8,501–10,000 lbs. (LHDT1)	94	158	141	142	94	52
Light-Heavy Duty 10,001–14,000 lbs. (LHDT2)	23	39	35	35	23	13
Motorcycles (MCY)	15	26	23	23	15	8
Medium-Duty Trucks 14,001–33,000 lbs. (MDV)	421	710	634	641	424	235
Motor Homes (MH)	2	3	2	2	2	1
Medium-Heavy-Duty (MHDT)	55	93	83	84	55	31
Other Buses (OBUS)	16	27	24	24	16	9
School Buses (SBUS)	3	6	5	5	3	2
Urban Buses (UBUS)	24	41	37	37	25	14
Total	***3,180***	***5,360***	***4,790***	***4,840***	***3,440***	***1,910***

SOURCES: EMFAC2021; ESA 2021.

ABBREVIATIONS:

Blvd. = Boulevard; St. = Street; Ave. = Avenue; C. Chavez = Cesar Chavez; The Emb. = The Embarcadero; VMT = vehicle miles traveled; EMFAC2021 = EMission FACtors model version 2021; lbs. = pounds

NOTES:

[a] Default fleet mix for San Francisco County; see Table 1.
[b] Fleet mix adjusted to account for an average of 8.1 percent HHDT; see Table 1.
[c] Based on the Travel Demand Memorandum for the Plan.

EF = Engine emission factor, grams/mile (EMFAC2021)
Conv = Conversion factor, 0.002205 pounds/gram
i = Vehicle type

Table 3 presents the emission rates used in the modeling for ROG, NO_X, exhaust and fugitive $PM_{2.5}$, exhaust PM_{10} (DPM), and TOG.

TABLE 3
MOBILE SOURCE EMISSION RATES (GRAMS/MILE)

Plan Subarea	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Dust[a]	PM_{10} Exhaust (DPM)	TOG
Mission Bay, Fisherman's Wharf, Northeast Waterfront, South Beach[b]	0.002	0.019	0.002	0.142
Southern Waterfront[c]	0.003	0.019	0.003	0.158

SOURCES: EMFAC2021, ESA 2021.

ABBREVIATIONS:

$PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter;
PM_{10} = particulate matter less than or equal to 10 microns in diameter (used as a surrogate for DPM); DPM = diesel particulate matter;
TOG = total organic compound

NOTES:

a $PM_{2.5}$ dust includes tire wear, brake wear, and road dust.
b Based on the EMFAC2021 countywide fleet mix for San Francisco County.
c Adjusted the EMFAC2021 countywide fleet mix for San Francisco County to account for 8.1% heavy-heavy-duty trucks.

Stationary Sources

Stationary sources modeled for the Plan include back-up diesel generators. This analysis conservatively assumes that each Health Risk Study Area (see description below) would include up to one large diesel generator at 1,500 kilowatts (kW).

Generator Activity

Emergency generator emissions were estimated based on a maximum annual non-emergency operation schedule of 50 hours each per year.

Generator Emission Factors

Emissions factors for the generators were based on United States Environmental Protection Agency (U.S. EPA) federal Tier 4 diesel engine standards for diesel engines with a power rating >560 kilowatts (kW) [751 horsepower (hp)], since all new generators within the BAAQMD greater than 746 kW (1,000 hp) must meet Tier 4 final standards.[4] Tier 4 emission standards were phased in over the period of 2008 to 2015. As of 2015, Tier 4 final standards require that emissions of PM and NO_X be further reduced by 90 percent.[5] **Table 4** presents the generator characteristics and emission factors used in the analysis.

4 Bay Area Air Quality Management District, *BACT Determination for Diesel Back-Up Engines Greater than or equal to 1,000 Brake Horsepower*, December 2020.

5 United States Environmental Protection Agency, *Final Rule for Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel*, 2004, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-emissions-air-pollution-nonroad-diesel#rule-summary, accessed May 2021.

TABLE 4
EMERGENCY DIESEL GENERATOR INFORMATION AND EMISSION RATES

Generator Characteristics	
Size	1,500 kW (2,012 hp)
Load Factor	0.74
Operating Hours per unit	2 hours/day maximum or 50 hours/year (average 0.14 hours/day) for testing and maintenance
Generator Emission Factors (g/hp-hr)	NMHC + NO_X: 0.64[a]
	NO_X: 0.5
	Total PM: 0.022[b]

SOURCES: United States Environmental Protection Agency, *Final Rule for Control of Emissions of Air Pollution From Nonroad Diesel Engines and Fuel*, 2004, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-control-emissions-air-pollution-nonroad-diesel#rule-summary, accessed May 2021.
South Coast Air Quality Management District, Overview – Off-Road Engines Mitigation Measure Tables, 2010, http://www.aqmd.gov/docs/default-source/ceqa/handbook/mitigation-measures-and-control-efficiencies/off-road-engines/off-road-engines-overview.pdf, accessed May 2021.
South Coast Air Quality Management District, *Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds*, October 2006.

ABBREVIATIONS:

kW = kilowatts; hp = horsepower; g/hp-hr = grams per horsepower-hour; NMHC = non-methane hydrocarbons; NO_X = oxides of nitrogen; PM = particulate matter

NOTES:

[a] It is assumed that 5% of NMHC + NO_X is ROG.
[b] The PM_{10} fraction of total PM is 0.960; the $PM_{2.5}$ fraction of total PM is 0.937 (based on data from SCAQMD).

Maritime Sources

The Plan is not anticipated to result in any additional cruise ship calls at the waterfront, nor would the Plan result in an increase to cargo or non-cruise vessels. However, emissions were estimated for maritime sources that could be relocated to Pier 50 (from Pier 35) anticipated to occur with implementation of the Plan. For the exposure of sensitive receptors to TAC emissions associated with the relocation of the cruise ships, maneuvering emissions were estimated from the pier out to 1,000 meters, which represents the modeling domain for the HRA.

Table 5 presents cruise ship calls and total vessel engine power. **Table 6** presents assist tug vessel characteristics.

TABLE 5
MODELED MARITIME ACTIVITY – CRUISE SHIPS

Name	Date of Call	Total Engine Power (kW)
MSC Magnifica	2/9/2019	57,980
Artania	2/10/2019	27,840
Balmoral	2/22/2019	21,300
Maasdam	5/7/2019	34,560
Crystal Symphony	6/16/2019	25,260
Crystal Symphony	9/25/2019	25,260
Seven Seas Mariner	9/28/2019	31,680
Star Legend	9/30/2019	7,280
Oosterdam	10/3/2019	35,240
Seabourn Sojourn	10/13/2019	23,040

SOURCE: Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021.

ABBREVIATION:

kW = kilowatts

NOTE: These call dates are for cruise ship activity at Pier 35 during 2019.

TABLE 6
MODELED MARITIME ACTIVITY –ASSIST TUG FLEET

Fleet[a]	Name	Model Year	Propulsion Power (hp)	Auxiliary Power (hp)
AMNAV	Revolution	2006	5,080	282
AMNAV	Sandra Hughes	2006	5,080	282
AMNAV	Liberty	2008	3,300	282
AMNAV1	Patriot	2006	4,300	282
AMNAV	Patricia Ann	2008	5,080	282
Bay Delta	Delta Billie	2009	6,712	288
Bay Delta	Delta Cathryn	2009	6,712	288
Bay Delta	Delta Audrey	2014	6,712	288
Crowley	Goliah	2013	5,150	288
Crowley	Valor	2007	6,800	288
Foss	Keegan Foss	1998	3,900	266
Foss	Pacific Star	2008	6,610	266
Foss	Caden Foss	2017	6,772	489
Foss	America	2008	6,610	266
Foss	Lynn Marie	2001	6,250	282
Starlight	Ahbra Franco	2013	6,850	389
Starlight[b]	Z-3	2012	4,000	274
Starlight[b]	Z-4	2012	4,000	274
Starlight[b]	Z-5	2012	4,000	274

SOURCE: Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021.

ABBREVIATION:

hp = horsepower

NOTES:

[a] The assist tug fleet data is consistent with the 2017 Port of San Francisco Air Emissions Inventory.
[b] Rebuilt.

Maritime Emission Factors

Maritime emissions were estimated using methods from the 2017 Emissions Inventory developed for the Port of San Francisco and from CARB.[6,7] Using the 2017 inventory is a conservative method of predicting maritime emissions in 2030 for the Plan, because the 2017 inventory does not take into account vessel turnover, engine efficiency improvements, maritime engine emissions regulations, and the use of alternative fueled-engine technology (such as electricity and hydrogen fuel-cell), which would occur over the 13 years between 2017 and 2030. For all assist tugs, the main engine load factor was 0.31 and the auxiliary engine load factor was 0.43, consistent with the 2017 Port of San Francisco Inventory. The engine deterioration factor for PM was 0.67 and the main engine useful life was

[6] Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021.

[7] California Air Resources Board, *Appendix B: Emissions Estimation Methodology for Commercial Harbor Craft Operating in California*, 2012, https://ww3.arb.ca.gov/msei/chc-appendix-b-emission-estimates-ver02-27-2012.pdf, accessed March 2021.

21 years while the auxiliary engine useful life was 23 years.[8] Assist tug emissions were calculated for the entire Port of San Francisco fleet and then proportioned for this analysis based on the number of cruise ships reporting to Pier 35 relative to the entire waterfront. For the HRA, only maneuvering emissions within 1,000 meters of the shore were considered for cruise ships. For criteria pollutants, emissions were estimated for the additional cruise ship travel distance of 3 nautical miles from Pier 35 to Pier 50. The decrease in emissions associated with hoteling at Pier 35 compared to the use of shore power at Pier 50 was also estimated. **Table 7** presents cruise ship operating characteristics used for both the criteria pollutant analysis and the HRA. **Table 8** presents cruise ship emission factors used in the analysis. **Table 9** presents assist tug operating characteristics and PM emission factors used in the HRA.

TABLE 7
CRUISE SHIP OPERATING CHARACTERISTICS

Distance for Maneuvering (Meters)	1,000
Inbound maneuvering speed (knots)	7
Outbound maneuvering speed (knots)	8
Time at port for docking and undocking (hours)	0.5
maneuvering time for 1,000 meters (hours)	0.64
Main/Auxiliary Power	28,944
Boiler Power	1,000
maneuvering load factor	64%
Cruise Speed (knots)	19.7
Cruise speed load factor	82%
Round Trip Distance in nautical miles between Pier 35 and Pier 50 (nm)	6
Cruise time (hours)	0.30
Hoteling time (hours)	11
Hoteling load factor	16%

SOURCES: Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021. California Air Resources Board, *Appendix D: Emissions Estimation Methodology for Ocean-Going Vessels*, 2008, https://ww3.arb.ca.gov/regact/2008/fuelogv08/appdfuel.pdf, accessed May 2021.

TABLE 8
CRUISE SHIP EMISSION FACTORS

	PM_{10} Exhaust	**$PM_{2.5}$ Exhaust**
Main Engine Emission Factor – Transit, Maneuvering Mode (0.1% sulfur, medium speed) (g/kW-hr)	0.25	0.23
Auxiliary Engine Emission Factor – Transit, Maneuvering and Hoteling (0.1% sulfur, medium speed) (g/kW-hr)	0.25	0.23
Average Engine Emission Factor (g/kW-hr)	0.25	0.23
Auxiliary Boiler Emission Factor (marine gas oil) (g/kW-hr)	0.133	0.13

SOURCE: Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021.

ABBREVIATIONS:

ROG = reactive organic gases; NO_X = oxides of nitrogen; PM_{10} = particulate matter less than or equal to 10 microns in diameter $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; g/kW-hr = grams per kilowatt-hour

[8] Ibid.

TABLE 9
ASSIST TUG FLEET CHARACTERISTICS AND EMISSION FACTORS

Name	Zero Hour Emission Factor for main engine PM (EF_0)	Zero Hour Emission Factor for auxiliary engine PM (EF_0)	Fuel Correction Factor for PM (F)	Age of Engine (A)	Annual Operating Hours (hrs)
Revolution	0.36	0.15	0.8	12	37.71
Sandra Hughes	0.36	0.15	0.8	11	37.71
Liberty	0.2	0.15	0.8	9	37.71
Patriot	0.36	0.15	0.8	11	37.71
Patricia Ann	0.2	0.15	0.8	9	37.71
Delta Billie	0.2	0.15	0.8	8	30.80
Delta Cathryn	0.2	0.15	0.8	8	30.80
Delta Audrey	0.25	0.08	0.852	3	30.80
Goliah	0.2	0.15	0.852	4	18.33
Valor	0.2	0.15	0.8	10	18.33
Keegan Foss	0.5	0.32	0.8	19	52.16
Pacific Star	0.2	0.15	0.8	9	52.16
Caden Foss	0.03	0.08	0.852	0	52.16
America	0.2	0.15	0.8	9	52.16
Lynn Marie	0.36	0.32	0.8	16	52.16
Ahbra Franco	0.2	0.15	0.852	4	21.26
Z-3	0.2	0.15	0.852	5	21.26
Z-4	0.2	0.15	0.852	5	21.26
Z-5	0.2	0.15	0.852	5	21.26

SOURCE: Ramboll, *Port of San Francisco Seaport Air Emissions Inventory 2017*, Prepared for the Port of San Francisco, August 2019, https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf, accessed April 2021.

ABBREVIATIONS:

PM = particulate matter; EF_0 = zero-hour emission factor; hrs = hours

NOTES:

[a] The assist tug fleet data is consistent with the 2017 Port of San Francisco Air Emissions Inventory.

2.2 Health Risk Assessment

The HRA evaluates the estimated incremental increase in lifetime cancer risks from exposure to emissions of DPM and the annual average $PM_{2.5}$ concentrations associated with combustion (i.e., exhaust) that would be emitted by Plan-related operational vehicle traffic, emergency diesel generators, and maritime sources. Evaporative and exhaust toxic air contaminants, speciated from TOG emissions from on-road gasoline vehicles associated with Plan operations were also included in the cancer risk analysis. The analysis was conducted for three Plan subareas: South Beach, Mission Bay, and Southern Waterfront.

Additionally, the HRA estimates lifetime excess cancer risk and annual average exhaust $PM_{2.5}$ concentrations by considering the Plan's impact in aggregate with existing sources.

Source Parameters

Operational traffic associated with Plan activity was modeled along the road segments in the South Beach, Mission Bay, and Southern Waterfront subareas (listed below) that showed the greatest increase in traffic with Plan implementation.

South Beach Subarea

- The Embarcadero between Harrison and Bryant Streets
- Bryant Street between The Embarcadero and Main Street

Mission Bay Subarea

- Third Street between Mission Bay Boulevard South and 16th Street
- Third Street between 16th and Mariposa Streets

Southern Waterfront Subarea

- Third Street between 16th Street and Cesar Chavez
- Evans Avenue between 3rd and Newhall Streets

The generator was not modeled at a specific location because the number of generators and their locations are not known and the need for any generator would depend on the specific needs of the subsequent development projects. Instead, a generator was modeled at distance increments between 10 and 350 meters from the generator exhaust stack. The purpose of this analysis is to disclose the potential cancer risks and $PM_{2.5}$ concentrations for sensitive receptors within a certain radius of the generator (i.e., 30 meters).

Receptors and APEZ

A 20-meter receptor modeling grid, extending 1,000 meters from the Plan boundary for the South Beach, Mission Bay and Southern Waterfront subareas, was modeled within AERMOD to represent existing offsite sensitive receptors; this is the same receptor grid as used in the Citywide HRA. The modeling grid did not exclude receptors within the Plan boundary (and includes Seawall Lot 330).

Based on the APEZ map and GIS data, it was determined that the majority of the sensitive receptors within the modeling domain were designated as in the APEZ. However, some receptors in each of the two modeled plan areas were not designated as in the APEZ. Figure 2, Figure 3, and Figure 3, pp. 22, 23, and 23, also show the APEZ boundaries.

Exposure Assessment

Receptor types assessed in the HRA include existing resident, school, daycare, and healthcare sensitive receptors. However, note that all receptors were assessed using residential exposure assumptions, including potential future residential receptors within the Plan boundary, which were included in the modeling receptor grid. Using residential exposure assumptions would yield higher, worst-case, health risks for non-residential receptors because the exposure duration for a residential receptor assumes 30 years. Exposure durations for school, daycare, and healthcare receptors are shorter.

Exposure Scenario and Assumptions

A single exposure scenario was used to identify the sensitive receptor location where maximum health risk values would occur. This scenario is for the year 2030 assuming full Plan buildout, such that exposure would begin in 2030 and continue for 30 years, until 2060. The travel demand memorandum analyzed trip generation under the Plan for the 2020 and 2050 scenarios, and the 2020 Plan-associated trips were used in the HRA. However, the HRA assumes full buildout in 2030 instead of 2020, because full buildout would not be possible in 2020, as discussed above. The HRA would be overly-conservative using 2020 emission factors. Use of 2030 emission factors would be more reasonable and still conservative, as construction of all Plan development is not likely by 2030. Nevertheless, since some Plan development would occur by 2030, the HRA assumes full buildout in 2030 so as to not underestimate health risks.

Cumulative Risk

Projects quantitatively considered in the cumulative analysis include: Mission Rock, Pier 70, and the Potrero Power Station Mixed-Use Project (Potrero). Risk values for each of these project's MEIR locations was scaled based on the distance from these MEIR locations to the Plan's MEIR locations in order to estimate cancer risk at the Plan's MEIR locations. The scaling was conducted using BAAQMD's Health Risk Calculator with Distance Multipliers tool.[9] Other projects considered qualitatively in the cumulative analysis include: the Teatro Zinzanni project, the Port of San Francisco's Waterfront Resilience Program, the San Francisco Housing Element Update, and the Better Market Street Project.

A Mitigated Negative Declaration was prepared for the Teatro Zinzanni project, which did not calculate health risks. The Teatro Zinzanni project would involve short-term construction TAC emissions occurring over the 22-month construction period, anticipated to be from 2017 to 2019, and long-term operational TAC emissions associated with vehicle traffic (hotel guests, entertainment venue attendees, park visitors, and building employees). Construction emissions would occur before the Plan is operational, so these TAC emissions would not affect the Plan MEIRs. Operational TAC emissions would be associated with the project's approximately 634 daily vehicle trips, which is minor compared to the Plan's incremental increase in traffic of 3,200 to 5,400 daily vehicle trips. The project site is located 1,500 meters from the South Beach Type 2 MEIR, which is the nearest MEIR and is therefore anticipated to have a minor impact on all three of the analyzed subarea MEIRs. This is because emissions disperse from their point of origin and emissions that occur 1,000 feet from a source (which is considered the zone of influence by the air district) are considered to have a minimal cumulative effect on the project MEIR.[10]

The Better Market Street Project would not have a substantial effect on regional emissions but would relocate emissions sources. TAC emissions associated with the Better Market Street Project would include short-term DPM from off-road construction equipment as well as DPM, gasoline TOGs, and $PM_{2.5}$ exhaust from the project's vehicle redistribution. The Better Market Street Project identified health risks of an incremental increase in cancer risk of 2.4 per million and an annual average $PM_{2.5}$ concentration of less than 0.1 $\mu g/m^3$, but their MEIR (Octavia and Market streets) is approximately 3,000 meters from the Mission Bay MEIR identified for the Plan, so risk

[9] Bay Area Air Quality Management District, *Tools and Methodologies: Health Risk Calculator with Distance Multipliers*, March 2020, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/tools/baaqmd-health-risk-calculator-beta-4-0-xlsx.xlsx?la=en, accessed May 2021.

[10] Bay Area Air Quality Management District, *CEQA Air Quality Guidelines*, May 2017, https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en, accessed August 26, 2021.

associated with construction and operations of the Better Market Street Project was not included in the cumulative risk assessment because risks would be negligible at that distance.

The Waterfront Resilience Program includes a U.S. Army Corp of Engineers Flood Study for the entire Port waterfront, as well as a program to strengthen the 3-mile-long Embarcadero Seawall from earthquake, flooding, and sea level rise risks. As part of the program, it is anticipated that improvements will involve short-term construction TAC emissions associated with off-road equipment activity and it is unknown at this time what potential long-term operational TAC emission could be associated with the program. The timeline of the program and associated construction are currently unknown.

The San Francisco Housing Element 2022 Update would modify the policies of the general plan's housing element. The goals, policies, and actions are required to plan for the regional housing targets allocated to San Francisco by regional agencies for the 2023–2031 cycle and meet future housing demand in San Francisco. The San Francisco Housing Element 2022 Update would not directly result in any emissions. New housing development constructed pursuant to the policies in the housing element would involve short-term construction TAC emissions; however, the specific locations and details regarding construction are unknown at this time. Long-term operational TAC emissions associated with new housing development would generally from residential vehicle trips to and from their residence as well as backup emergency generators, which could be required for taller residential buildings.

Neither the Waterfront Resilience Program nor the San Francisco Housing Element Update have completed their environmental review. Because of the lack of available emissions data for these nearby projects, cumulative health risks were not evaluated quantitatively.

Background (without Plan) cancer risk and PM2.5 concentrations in 2050 are expected to decrease due to improved vehicle fleets and the electrification of Caltrain. Additionally, any backup diesel generators or other stationary sources that may be proposed by cumulative projects would need to meet current air district permit requirements; therefore, emissions from these sources would be limited.

The cumulative analysis assumes full build out of the Plan traffic, so additional Plan traffic is not anticipated beyond that analyzed for this HRA. The contribution of Plan traffic emissions to cumulative 2050 health risks would likely decrease in the future (as would contribution of all traffic emissions) because new regulations would require lower emitting vehicles, and vehicle fleet turnover would result in lower emissions because older, dirtier vehicles would be retired from the fleet. Similarly, with the turnover in construction equipment to newer, cleaner equipment, the contribution of off-road equipment to health risks would likely decrease.

3. Uncertainties

The following is a summary discussion of the critical uncertainties associated with the air quality analysis modeling for TACs emission estimates and health risk calculations. Due to the complex nature of uncertainties associated with the numerous calculations performed in the air quality analysis, the discussion is qualitative in nature.

3.1 Emission Calculations

There are a number of uncertainties contained within the EMFAC2021 model, which was used to calculate on-road emissions for the proposed project. The model uses equations and emission factors that approximate actual activity and emissions associated with that activity, but they are only approximations. These methods and emission factors all contain some uncertainty because they are meant to approximate emissions based on typical engine operation and fuel combustion characteristics. In addition, many assumptions were used to estimate emissions for these sources. In general, these assumptions are conservative and likely result in an overestimate of actual emissions.

Generator emissions are based on an assumed number of testing and emergency use hours, but these are generally a conservative estimate of what would be the actual use. Marine emissions are also based on equations and emission factors that approximate actual activity and emissions associated with that activity, but they are only approximations based on fleet activity over a given period of time.

3.2 Air Concentrations and Source Representation

The source parameters used in the emissions modeling add uncertainty to the analysis. For all emission sources, ESA used source parameters that are either recommended as defaults, are consistent with the 2020 Citywide HRA methodology, or are expected to produce more conservative (i.e., overestimation of) results. Although differences may exist between the actual emissions characteristics of a source and its representation in the modeling, exposure concentrations used in this HRA represent approximate exposure concentrations.

3.3 Exposure Concentrations

When estimating pollutant exposures using the AERMOD dispersion mode, there is uncertainty embodied in the modeling. AERMOD's limitations provide a source of uncertainty in the estimation of exposure concentrations. According to the USEPA, errors of ±10 percent to 40 percent are typical for the highest estimated concentrations due to the limitation of the AERMOD algorithms.[11] The methods employed by ESA consistently produce conservative results and, therefore, estimated exposure concentrations are likely to be at or above actual exposure concentrations.

3.4 Exposure Assumptions

A number of assumptions must be made in order to estimate human exposure to chemicals. These assumptions include parameters such as breathing rates, exposure time and frequency, exposure duration, and human activity patterns (see Table 8 for these parameters). Although the best way to estimate central tendency is to use average values derived from scientifically defensible studies, many of the exposure variables used in this 2020 Citywide

[11] USEPA, *Guideline on Air Quality Models (Revised)*, 40 Code of Federal Regulations, Part 51, Appendix W, Office of Air Quality Planning and Standards, November 2005, https://www.epa.gov/ttn/scram/guidance_permit.htm#appw, accessed July 2021.

HRA per 2015 OEHHA guidelines are high-end estimates. For example, although the OEHHA guidance recommends assuming a period of time spent out of the home each day for residential sensitive receptors, this analysis conservatively assumes that 3rd trimester receptors are exposed 24 hours per day and children ages 0 to 2 are exposed 24 hours per day. These assumptions are highly conservative, since most residents do not remain in their homes for these periods of time throughout the year. Further this analysis follows OEHHA guidance in evaluating outdoor air; however, indoor air concentrations may be different due to filtration or other reductions resulting from the building shell or HVAC systems. The combination of several high-end and conservative estimates used as exposure parameters may substantially overestimate chemical intake. The excess lifetime cancer risks calculated in this HRA are therefore likely to be overestimated.

3.5 Toxicity Assessment

The standard cancer potency factor (CPF) established by OEHHA for DPM was used to estimate potential carcinogenic health effects from exposures to DPM emitted from project construction. The CPF for DPM is derived by applying conservative assumptions which are intended to protect the most sensitive individuals in the potentially exposed populations.

To derive the CPF toxicity value for DPM, OEHHA makes several assumptions that tend to overestimate the actual hazard or risk to human health. CPFs used to estimate carcinogenic risk are also typically derived based on data from animal studies. These studies often administer high doses of a test chemical to laboratory animals, and the reported response is extrapolated to the much lower doses typical of human exposure. Very little experimental data are available on the nature of the dose-response relationship at low doses (e.g., whether a threshold exists or if the dose-response curve passes through the origin). Because of this uncertainty, a conservative model is used to estimate the low-dose relationship, and uses an upper bound estimate (the 95 upper confidence limit of the slope predicted by the extrapolation model) as the CPF. With this factor, an upper-bound estimate of potential cancer risks is calculated.

The OEHHA CPF for DPM (1.1 mg/kg-day) is used to estimate cancer risks associated with exposure to DPM from diesel trucks, marine sources, and the generator. However, the CPF is highly uncertain in both the estimation of response and dose. Due to inadequate animal test data and epidemiology data on diesel exhaust, the International Agency for Research on Cancer (IARC), a branch of the World Health Organization (WHO), had previously classified DPM as Probably Carcinogenic to Humans (Group 2). The USEPA had also previously concluded that the existing data did not provide an adequate basis for quantitative risk assessment.[12] However, based on two scientific studies,[13] IARC has re-classified DPM as Carcinogenic to Humans to Group 1.[14] This means that the IARC has determined that there is "sufficient evidence of carcinogenicity" of a substance in humans and represents the strongest weight-of-evidence rating in IARC's carcinogen classification scheme. This determination by the IARC may provide additional impetus for the USEPA to identify a quantitative dose-response relationship between exposure to DPM and cancer.

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12 USEPA, *Health Assessment Document for Diesel Engine Exhaust*, National Center for Environmental Assessment, Office of Research and Development, Washington, DC, EPA/600/8-90/057F, May 2002, https://cfpub.epa.gov/ncea/risk/recordisplay.cfm?deid=29060, accessed July 2021.

13 Attfield, MD, PL Schleiff, JH Lubin, A Blair, PA Stewart, R Vermeulen, JB Coble, DT Silverman, *The Diesel Exhaust in Miners Study: A Nested Case-Control Study of Lung Cancer and Diesel Exhaust*, J Natl Cancer Inst., 2012.

14 International Agency for Research on Cancer, *Press Release: IARC: Diesel Engine Exhaust Carcinogenic*, June 2012, https://www.iarc.fr/en/media-centre/pr/2012/pdfs/pr213_E.pdf, accessed July 2021.

3.6 Risk Calculations

The USEPA states that the conservative assumptions used in a risk assessment, such as this HRA, are intended to assure that the estimated risks do not underestimate the actual risks posed by a source. Further, that the estimated risks do not necessarily represent actual risks experienced by populations at or near a site.[15]

As noted above, the estimated risks in this HRA are based primarily on a series of conservative assumptions related to predicted environmental concentrations, exposure, and chemical toxicity. The use of conservative assumptions tends to produce upper-bound estimates of risk. The use of conservative assumptions is likely to result in overestimates of exposure and, therefore, risk, although it is difficult to quantify the uncertainties associated with all the assumptions made in this HRA.

[15] USEPA, *Risk Assessment Guidance for Superfund Human Health Risk Assessment: U.S. EPA Region IX Recommendations (Interim Final), San Francisco, CA*, December 1989.

4. Results

This section presents the results of the HRA for implementation of the Plan.

4.1 Health Risk Assessment

This section addresses cancer risk associated with DPM and TOG exposure, along with annual average $PM_{2.5}$ concentrations, as a result of uncontrolled[16] emissions. Health risks are evaluated by combining background cancer risk and annual average $PM_{2.5}$ concentrations for existing conditions (2020) from the Citywide-HRA with cancer risk and annual average $PM_{2.5}$ concentrations for the Plan (2030). The analysis is based on traffic associated with full Plan buildout, and in that respect is conservative because it assumes the 2030 emission factors and it is unlikely that the Plan would be fully built out by 2030. However, the HRA does not account for construction emissions associated with Plan buildout, so the health risks reported in this memorandum are likely lower than may be experienced because it doesn't account for the contribution from construction emissions.

- **Table 10:** Maximum health risks associated with Plan operational activities at the South Beach, Mission Bay and Southern Waterfront subareas for those receptors *not within* the APEZ during existing conditions, but which would be *brought into* the APEZ during existing plus Plan conditions (receptor type 1).
- **Table 11:** Maximum health risks associated with Plan operational activities at the South Beach, Mission Bay and Southern Waterfront subareas for those receptors located *within* the APEZ during existing conditions and which would continue to be located within the APEZ during existing plus Plan conditions (receptor type 2).
- **Table 12:** Health risks associated with Plan emergency backup diesel generators at a given distance from the generator exhaust stack.

[16] Uncontrolled does not assume any emission reduction strategies.

TABLE 10
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS – RECEPTORS NOT LOCATED IN THE APEZ BUT WOULD BE LOCATED IN THE APEZ WITH THE PLAN

	South Beach Subarea		Mission Bay Subarea		Southern Waterfront Subarea	
Subarea/Scenario/ Receptor Type	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**
Plan Subareas						
Receptor Location[a] (UTM X, UTM Y)	(553900, 4180680)	(553900, 4180680)	(553900, 4180700)	(553880, 4179720)	(553540, 4176920)	(553540, 4176920)
Mobile Sources[b]	<0.01	<0.01	0.46	0.08	0.02	<0.01
Marine Vessels[b]	—	—	1.89	<0.01	—	—
Generator[b]	1.04	<0.01	1.04	<0.01	1.04	<0.01
Plan Total at MEIR not in APEZ (2030)	1.04	0.001	3.40	0.08	1.0	0.002
Existing (2020)	99.15	8.78	98.8	9.21	81.3	9.00
Existing + Plan[c]	*100.2*	*8.78*	*102.2*	*9.30*	*82.4*	*9.00*
Cumulative Projects						
Mission Rock	3.24	0.08	3.72	<0.01	<0.1	<0.01
Pier 70	0.01	<0.01	<0.1	0.16	<0.1	<0.01
Potrero	<0.01	<0.01	<0.1	<0.01	<0.1	<0.01
Cumulative Total[c]	***103.4***	***8.86***	***106.0***	***9.46***	***82.4***	***9.00***

SOURCE: ESA 2021.

ABBREVIATIONS:

$PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters;
UTM = Universal Transverse Mercator; UTM X = eastward-measured distance; UTM Y = northward-measured distance; MEIR = Maximally Exposed Individual Receptor; Potrero = Potrero Power Station Mixed-Use Project

NOTES:

[a] Maximally impacted sensitive receptor.

[b] Categories defined as follows:

Mobile Sources = Operational emission from Plan-generated traffic. Refer to Table 1, p. 5, for activity assumptions and Table 3, p. 7, for emission factors. Emissions were modeled using EMFAC2021.

Generators = Operational emissions from emergency diesel generators. Refer to Table 4, p. 8, for activity assumptions and Table 5, p. 8, for emission factors. Emissions were modeled using USEPA Tier 4 final standards. The cancer risk and $PM_{2.5}$ concentrations reported in this table are the highest modeled values from Table 12.

Marine Vessels = Operational emissions from cruise ship maneuvering within 1,000 meters of Pier 50 and assist tug operations. TACs from TOG are not included in the HRA because DPM emissions represent the majority of cancer risk associated with diesel engines. Refer to Table 5 and Table 6, p. 9, for activity assumptions and Table 7, Table 8, and Table 9, pp. 10 to 11, for emission factors. Emissions were modeled using methods from the 2017 Emissions Inventory developed for the Port of San Francisco.

[c] *Existing + Plan* and/or *Cumulative Total* risk may not appear to add due to rounding.

TABLE 11
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS – RECEPTORS LOCATED IN THE APEZ

	South Beach Subarea[a]		Mission Bay Subarea		Southern Waterfront Subarea	
Subarea/Scenario/ Receptor Type	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**	**Lifetime Excess Cancer Risk (chances per million)**	**Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)**
Plan Subareas						
Receptor Location[b] (UTM X, UTM Y)	(553860, 4182360)	(553860, 4182360)	(553780, 4180620)	(553780, 4180620)	(553880, 4177360)	(553880, 4177360)
Mobile Sources[c]	3.04	0.21	2.80	0.20	0.17	0.01
Marine Vessels[c]	—	—	1.58	<0.01	—	—
Generator[c]	1.04	<0.01	1.04	<0.01	1.04	<0.01
Plan Total at MEIR in APEZ (2030)	4.1	0.21	5.4	0.20	1.2	0.01
Existing (2020)	316.7	12.80	140.3	9.42	135.4	10.23
Existing + Plan[d]	*320.8*	*13.01*	*145.8*	*9.62*	*136.6*	*10.24*
Cumulative Projects						
Mission Rock	<0.1	<0.01	2.1	0.05	<0.1	<0.01
Pier 70	<0.1	<0.01	<0.1	<0.01	<0.1	<0.01
Potrero	<0.1	<0.01	<0.1	<0.01	<0.1	<0.01
Cumulative Total[d]	***320.8***	***13.01***	***147.9***	***9.68***	***136.6***	***10.24***

SOURCE: ESA 2021.

ABBREVIATIONS:

$PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters; UTM = Universal Transverse Mercator; UTM X = eastward-measured distance; UTM Y = northward-measured distance; Potrero = Potrero Power Station Mixed-Use Project; MEIR = Maximally Exposed Individual Receptor

NOTES:

[a] South Beach Subarea MEIR is at a proposed residential development that is part of the plan (Seawall Lot 330)

[b] Maximally impacted sensitive receptor.

[c] Categories defined as follows:

Mobile Sources = Operational emission from Plan-generated traffic. Refer to Table 1, p. 5, for activity assumptions and Table 3, p. 7, for emission factors. Emissions were modeled using EMFAC2021.

Generators = Operational emissions from emergency diesel generators. Refer to Table 4, p. 8, for activity assumptions and Table 5, p. 8, for emission factors. Emissions were modeled using USEPA Tier 4 final standards.

Marine Vessels = Operational emissions from cruise ship maneuvering within 1,000 meters of Pier 50 and assist tug operations. TACs from TOG are not included in the HRA because DPM emissions represent the majority of cancer risk associated with diesel engines. Refer to Table 5 and Table 6, p. 9, for activity assumptions and Table 7, Table 8, and Table 9, pp. 10 to 11, for emission factors. Emissions were modeled using methods from the 2017 Emissions Inventory developed for the Port of San Francisco.

[d] *Existing + Plan* and/or *Cumulative Total* risk may not appear to add due to rounding.

TABLE 12
UNCONTROLLED LIFETIME EXCESS CANCER RISK AND ANNUAL AVERAGE $PM_{2.5}$ CONCENTRATIONS – EMERGENCY GENERATOR 1,500 KW (2,012 HP)

Receptor Distance from Emergency Generator Exhaust Stack (m)	Lifetime Excess Cancer Risk (chances per million)	Annual Average $PM_{2.5}$ Concentrations ($\mu g/m^3$)
10	0.32	0.0004
20	0.85	0.0011
30	1.04	0.0014
40	1.04	0.0014
50	0.96	0.0013
60	0.87	0.0011
70	0.78	0.0010
80	0.69	0.0009
90	0.62	0.0008
100	0.56	0.0007
150	0.36	0.0005
200	0.26	0.0003
250	0.21	0.0003
300	0.17	0.0002
350	0.15	0.0002

SOURCE: ESA 2021.

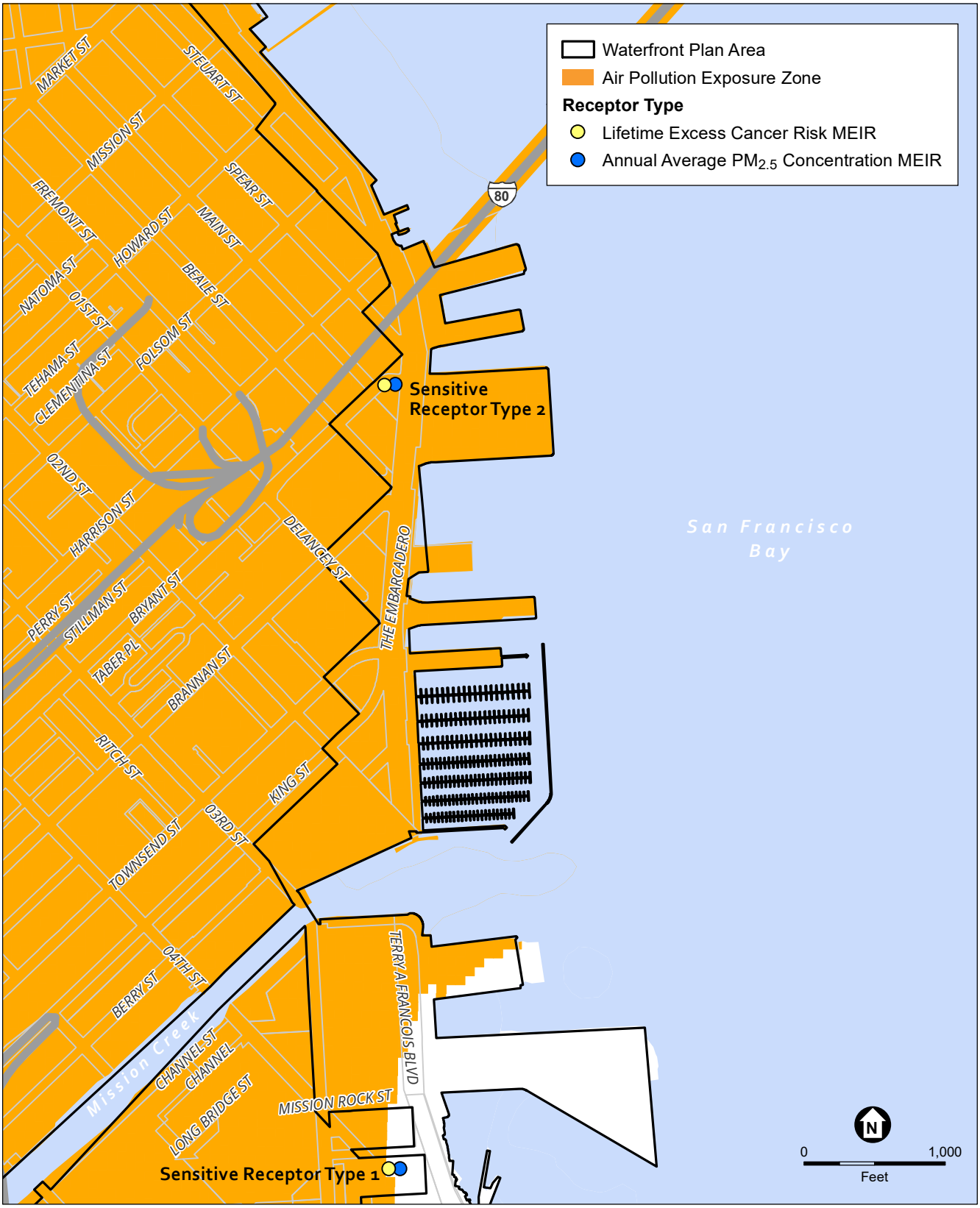
ABBREVIATIONS:

$PM_{2.5}$ = fine particulate matter less than 2.5 micrometers in aerodynamic diameter; $\mu g/m^3$ = micrograms per cubic meters; m = meters.

NOTES: The maximum cancer risk and $PM_{2.5}$ concentrations were modeled at 30 and 40 meters. These values were added to the MEIR values for each subarea, assuming a generator could be present in each subarea.

Both Table 10 and Table 11 include health risk information at the maximally impacted sensitive receptor for lifetime excess cancer risk (chances per million) and average annual $PM_{2.5}$ concentrations ($\mu g/m^3$). The tables also include scaled risk values from construction and operational TAC emissions associated with Mission Rock, Pier 70, and the Potrero Power Station Mixed-Use Project. Table 12 includes health risk information at distance increments from the emergency generator exhaust stack. The distance at which the maximum risk and $PM_{2.5}$ concentrations were modeled is conservatively added to the MEIR risk from mobile sources for the South Beach and Southern Waterfront subareas, and to the risk from mobile sources and marine for the Mission Bay subarea.

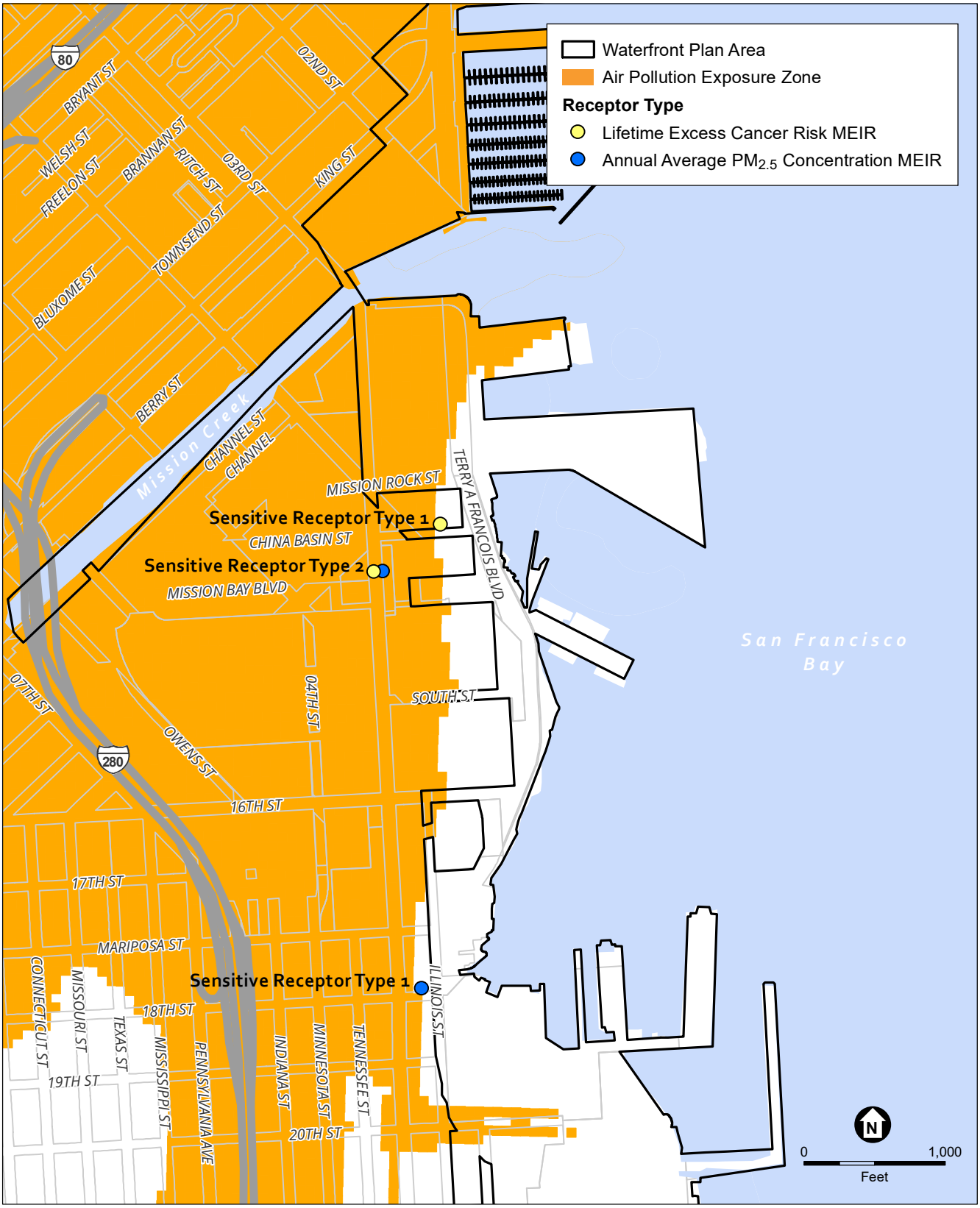
Figure 2, Figure 3, and 4 show the locations of each South Beach, Mission Bay, and Southern Waterfront MEIR, respectively, listed in Table 10 (receptor type 1) and in Table 11 (receptor type 2).



SOURCE: San Francisco Planning Department, 2021; ESA, 2021

Waterfront Plan

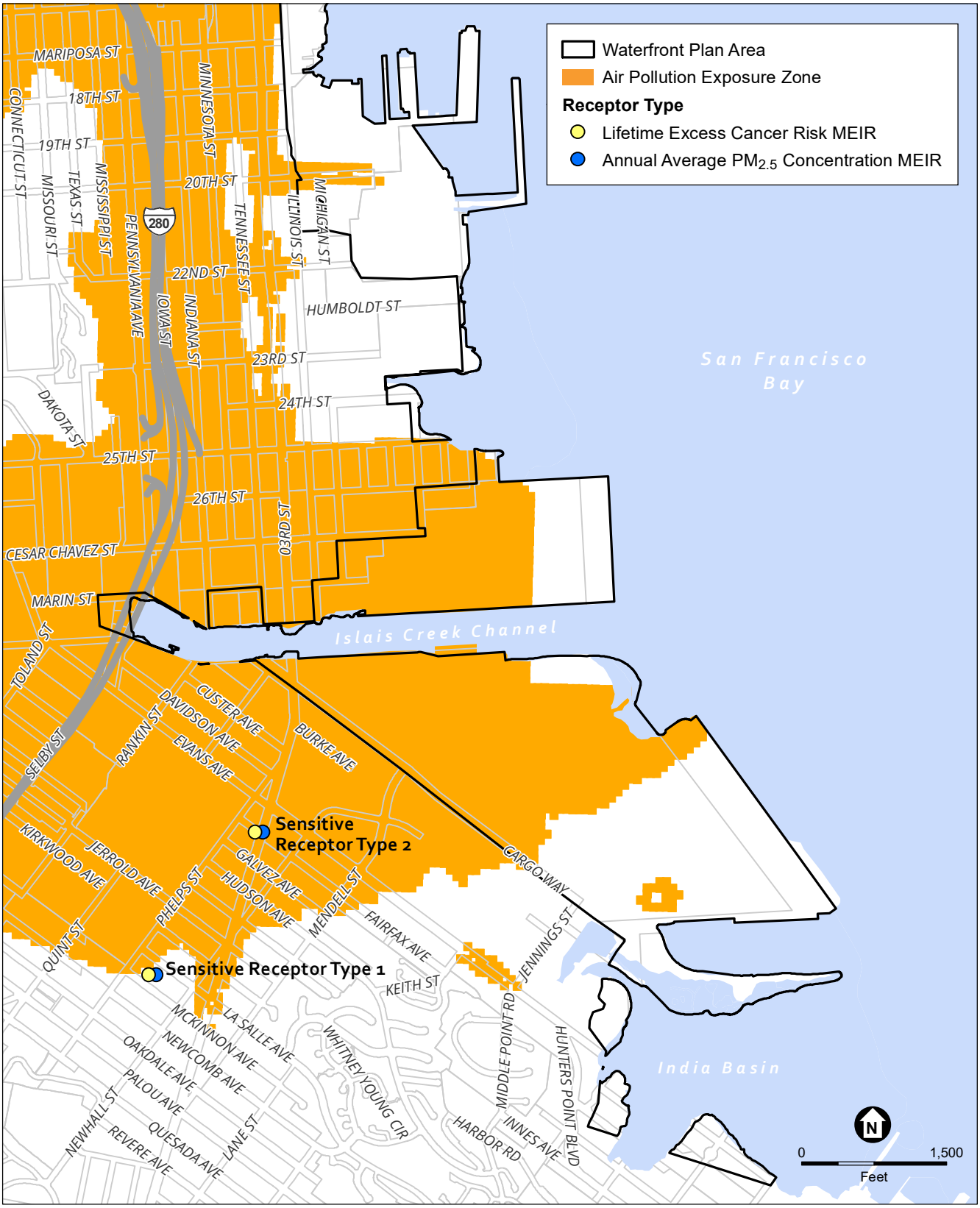
FIGURE 2
SOUTH BEACH MEIR LOCATIONS



SOURCE: San Francisco Planning Department, 2021; ESA, 2021

Waterfront Plan

FIGURE 3
MISSION BAY MEIR LOCATIONS



SOURCE: San Francisco Planning Department, 2021; ESA, 2021

Waterfront Plan

FIGURE 4
SOUTHERN WATERFRONT MEIR LOCATIONS

APPENDIX H

Plant and Wildlife Species Lists and Potential to Occur in the Study Area

H1 Special-Status Species Potential to Occur within the Study Area

Table H1-1 Special-Status Species Potential to Occur within the Study Area

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
PLANTS			
Franciscan onion *Allium peninsulare* var. *franciscanum*	—/—/1B.2	Dry hillsides. Elevation ranges from 0 to 980 feet (0 to 300 meters). Blooms May–June.	**Low.** Coastal scrub/grassland present in study area may provide marginal suitable habitat; there are no records of this species in San Francisco County.
Bent-flowered fiddleneck *Amsinckia lunaris*	—/—/1B.2	Gravelly slopes, grassland, openings in woodland, often serpentine. Elevation ranges from 9 to 1,640 feet (3 to 500 meters). Blooms Mar–Jun.	**Low.** Coastal scrub/grassland present in study area may provide marginal suitable habitat; has not been observed in San Francisco County since 1963.
Franciscan manzanita *Arctostaphylos franciscana*	FE/—/1B.1	Serpentine outcrops in chaparral. Elevation ranges from 195 to 985 feet (60 to 300 meters). Blooms Feb–Apr.	**No potential.** No suitable habitat present in study area.
San Bruno Mtn manzanita *Arctostaphylos imbricata*	—/SE/1B.1	Sandstone outcrops; chaparral. Elevation ranges from 650 to 1,310 feet (200 to 400 meters). Blooms Jan–Mar.	**No potential.** Study area is outside the elevation and geographic range for this species.
Presidio manzanita *Arctostaphylos montana* ssp. *ravenii*	FE/SE/1B.1	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 145 to 705 feet (45 to 215 meters). Blooms Feb–Mar.	**No potential.** Study area is outside the elevation range.
Marsh sandwort *Arenaria paludicola*	FE/SE/1B.1	Sandy soils. Openings in vegetation in marshes and swamps (freshwater or brackish). Elevation 1 to 55 feet (3 to 170 meters). Blooms May–Aug.	**Low.** No known extant populations in San Francisco County.
alkali milk-vetch *Astragalus tener* var. *tener*	—/—/1B.2	Alkaline flats and vernally moist meadows. Elevation ranges from 0 to 195 feet (1 to 60 meters). Blooms Mar–Jun.	**Low.** Not observed in San Francisco County since 1868.
Sonoma sunshine *Blennosperma bakeri*	FE/SE/1B.1	Valley and foothill grassland (mesic); vernal pools. (No elevation data). Blooms Mar–May.	**Low.** Not observed in San Francisco County.

Common Name ***Scientific Name***	**Status**	**General Habitat Requirements**	**Potential for Species Occurrence**
Coastal bluff morning glory *Calystegia purpurata* ssp. *saxicola*	—/—/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, north coast coniferous forest. Elevation ranges from 55 to 1,510 feet (18 to 460 meters). Blooms (Mar) Apr–Sep.	**Low.** Study area is outside of this species known range.
Bristly sedge *Carex comosa*	FE/SE/2B.1	Coastal prairie, marshes and swamps (lake margins), valley and foothill grassland. Elevation ranges from 0 to 2,050 feet (0 to 625 meters). Blooms May–Sep.	**No potential.** No suitable habitat present in study area.
Northern meadow sedge *Carex praticola*	—/—/2B.2	Meadows and seeps (mesic). Elevation ranges from 0 to 10,500 feet (0 to 3,200 meters). Blooms May–Jul.	**No potential.** No suitable habitat present within study area
Point Reyes bird's-beak *Chloropyron maritimum* ssp. *palustre*	—/—/1B.2	Marshes and swamps (coastal salt). Elevation ranges from 0 to 35 feet (0 to 10 meters). Blooms Jun–Oct.	**Moderate.** There is a recent documented occurrence from the nearby Presidio of San Francisco.
San Francisco Bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	—/—/1B.2	Coastal bluff scrub, coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 5 to 705 feet (3 to 215 meters). Blooms Apr–Jul(Aug).	**Low.** While this species may occur within the study area on disturbed sites within sandy soils, all extant populations occur along the open ocean, not within the bay.
Robust spineflower *Chorizanthe robusta* var. *robusta*	FE/—/1B.1	Chaparral (maritime), cismontane woodland (openings), coastal dunes, coastal scrub. Elevation ranges from 5 to 985 feet (3 to 300 meters). Blooms Apr–Sep.	**Low.** All nearby historic documented occurrences are presumed to have been extirpated.
Sonoma spineflower *Chorizanthe valida*	FE/SE/1B.1	Coastal prairie (sandy). Elevation ranges from 0 to 15 feet (0 to 5 meters). Blooms Jun–Aug.	**No potential.** Species' range is restricted to Marin and Sonoma Counties.
Franciscan thistle *Cirsium andrewsii*	—/—/1B.2	Bluffs, ravines, seeps, occasionally on serpentine. Elevation ranges from 0 to 490 feet (0 to 150 meters). Blooms Mar–Jul.	**Low.** This species may occur within the study area at India Basin.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Mt. Tamalpais thistle *Cirsium hydrophilum* var. *vaseyi*	—/—/1B.2	Serpentine seeps; broadleafed upland forest, chaparral, meadows and seeps. Elevation 460 to 2,100 feet (140 to 640 meters). Blooms May–Aug.	**No potential.** Study area is outside the species' elevation range.
Presidio clarkia *Clarkia franciscana*	FE/SE/1B.1	Serpentine soil. Elevation ranges from 15 to 490 feet (5 to 150 meters). Blooms Apr–Jun.	**No potential.** No suitable habitat present within study area
Round-headed Chinese-houses *Collinsia corymbosa*	—/—/1B.2	Coastal dunes. Elevation ranges from 0 to 65 feet (0 to 20 meters). Blooms Apr–Jun.	**Moderate.** Suitable coastal dunes habitat present within the study area at India Basin.
San Francisco Collinsia *Collinsia multicolor*	—/—/1B.2	Moist, somewhat shady scrub and forests. Elevation ranges from 95 to 820 feet (30 to 250 meters). Blooms (Feb)Mar–May.	**Low.** Coastal scrub present within study area at India Basin may provide marginal suitable habitat; however, study area is outside the species' elevation range.
Western leatherwood *Dirca occidentalis*	—/—/1B.2	Generally north or northeast facing slopes, mixed-evergreen forest to chaparral, generally in fog belt. Elevation ranges from 80 to 1,395 feet (25 to 425 meters). Blooms Jan–Mar(Apr).	**No potential.** No suitable habitat present within study area.
San Joaquin spearscale *Extriplex joaquinana*	—/—/1B.2	Alkaline soils. Elevation 15 to 2,725 feet (5 to 830 meters).Blooms Apr–Sep.	**No potential.** Study area is outside the geographic range for this species.
Marin checker lily *Fritillaria lanceolata* var. *tristulis*	—/—/1B.1	Coastal bluff scrub, coastal prairie, coastal scrub. Elevation ranges from 45 to 490 feet (15 to 150 meters). Blooms Feb–May.	**No potential.** Study area is outside the elevation and geographic range for this species.
Fragrant fritillary *Fritillaria liliacea*	—/—/1B.2	Heavy soil, open hills, fields near coast. Elevation ranges from 5 to 1,345 feet (3 to 410 meters). Blooms Feb–Apr.	**Low.** Coastal scrub/grassland present in study area may provide marginal suitable habitat; there are no records of this species in San Francisco County since 1890.
Blue coast gilia *Gilia capitata* ssp. *chamissonis*	—/—/1B.1	Coastal sand hills. Elevation ranges from 5 to 655 feet (2 to 200 meters). Blooms Apr–Jul.	**Moderate.** Suitable habitat present within coastal dunes within the study area at India Basin. Several recent nearby documented occurrences.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Dark-eyed gilia *Gilia millefoliata*	—/—/1B.2	Coastal dunes. Elevation ranges from 5 to 100 feet (2 to 30 meters). Blooms Apr–Jul.	**Low.** Marginal suitable habitat present within coastal dunes within the study area at India Basin; however, species; not observed in San Francisco since 1912.
Congested-headed hayfield tarplant *Hemizonia congesta* ssp. *congesta*	—/—/1B.2	Valley and foothill grassland. Elevation ranges from 65 to 1,835 feet (20 to 560 meters). Blooms Apr–Nov.	**No potential.** Presumed extirpated from San Francisco County.
Marin western flax *Hesperolinon congestum*	FT/ST/1B.1	Serpentine soils. Elevation ranges from 15 to 1,215 feet (5 to 370 meters). Blooms Apr–Jul.	**No potential.** Suitable habitat not present within the study area.
Water star-grass *Heteranthera dubia*	—/—/2B.2	Marshes and swamps (alkaline, still or slow-moving water). Elevation ranges from 95 to 4,905 feet (30 to 1,495 meters). Blooms Jul–Oct.	**Low.** The species may occur in slow-moving or still water throughout the study area; however, the species may be extirpated from San Francisco County as there are no occurrences listed in California Consortium of Herbaria (2020); study area is outside species' elevation range.
Santa Cruz tarplant *Holocarpha macradenia*	FT/SE/1B.1	Coastal prairie, coastal scrub, valley and foothill grassland; often clay or sandy soil. Elevation ranges from 15 to 460 feet (5 to 140 meters). Blooms Jun–Oct.	**Low.** Coastal scrub/grassland present in study area may provide marginal suitable habitat; there are no documented occurrences from San Francisco County.
Kellogg's horkelia *Horkelia cuneata* var. *sericea*	—/—/1B.1	Closed-cone coniferous forest, chaparral (maritime), coastal dunes, coastal scrub. Elevation ranges from 30 to 655 feet (10 to 200 meters). Blooms Apr–Sep.	**Low.** Some marginal suitable habitat present within the study area, but there are no nearby recent occurrences.
Point Reyes Horkelia *Horkelia marinensis*	—/—/1B.2	Coastal dunes, coastal prairie, coastal scrub. Elevation ranges from 15 to 2,475 feet (5 to 755 meters). Blooms May–Sep.	**Low.** Some marginal suitable habitat present within coastal dunes within the study area at India Basin, but there are no nearby recent occurrences.
Island rock lichen *Hypogymnia schizidiata*	—/—/1B.3	Closed-cone coniferous forest, chaparral. Elevation ranges from 1,180 to 1,330 feet (360 to 405 meters).	**No potential.** Study area is outside the species' elevation range.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Beach layia *Layia carnosa*	FE/SE/1B.1	Coastal bluff scrub, coastal dunes, coastal scrub. Elevation ranges from 15 to 1,705 feet (5 to 520 meters). Blooms Jan–Nov.	**Low.** While this species may occur within the India Basin Open Space, all extant populations occur along the open ocean, not within the bay.
Rose leptosiphon *Leptosiphon rosaceus*	—/—/1B.1	Open, grassy slopes and coastal bluffs. Elevation ranges from 0 to 330 feet (0 to 100 meters). Blooms Apr–Jul.	**Low.** Sandy areas present within the study provide suitable habitat. However, there are no recent occurrences in San Francisco County.
San Francisco lessingia *Lessingia germanorum*	FE/SE/1B.1	Coastal scrub (remnant dunes). Elevation ranges from 80 to 360 feet (25 to 110 meters). Blooms (Jun)Jul–Nov.	**Low.** Some marginal suitable habitat present within the study area, but there are no nearby recent occurrences; study area is outside the species' elevation range.
Mt. Diablo cottonseed *Micropus amphibolus*	—/—/3.2	Broadleaf upland forest, chaparral, cismontane woodland, valley and foothill grassland; rocky. Elevation ranges from 145 to 2,705 feet 45 to 825 meters). Blooms Mar–May.	**Low.** Some marginal suitable habitat present within the study area; study area is outside the species' elevation range.
Marsh microseris *Microseris paludosa*	—/—/1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1,165 feet (5 to 355 meters). Blooms Apr–Jun.	**Low.** Presumed extirpated from San Francisco County.
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE/SE/1B.1	Cismontane woodland, valley and foothill grassland (often serpentine). Elevation ranges from 110 to 2,035 feet (35 to 620 meters). Blooms Mar–May.	**Low.** Some marginal suitable habitat present within the study area; study area is outside the species' elevation range.
Choris' popcornflower *Plagiobothrys chorisianus* var. *chorisianus*	—/—/1B.2	Chaparral, coastal prairie, coastal scrub. Elevation ranges from 5 to 525 feet (3 to 160 meters). Blooms Mar–Jun.	**Low.** Not observed in San Francisco County since 1961.
San Francisco popcornflower *Plagiobothrys diffusus*	—/SE/1B.1	Coastal prairie, valley and foothill grassland. Elevation ranges from 195 to 1,180 feet (60 to 360 meters). Blooms Mar–Jun.	**Low.** Study area is outside the species' elevation range.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Hairless popcornflower *Plagiobothrys glaber*	—/—/1A	Meadows and seeps (alkaline); marshes and swamps (coastal salt). No elevation data available. Blooms Mar–May.	**Low.** No documented occurrences in San Francisco County.
Oregon polemonium *Polemonium carneum*	—/—/2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation ranges from 0 to 80 feet (0 to 25 meters). Blooms Apr–Sep.	**Low.** No documented occurrences in San Francisco County.
Adobe sanicle *Sanicula maritima*	—/SR/1B.1	Chaparral, coastal prairie, meadows and seeps, valley and foothill grassland; clay, serpentine soils. Elevation ranges from 95 to 785 feet (30 to 240 meters). Blooms Feb–May.	**No potential.** Study area is outside the species' elevation range.
Scouler's catchfly *Silene scouleri* ssp. *scouleri*	—/—/2B.2	Coastal bluff scrub, coastal prairie, valley and foothill grassland. Elevation ranges from 0 to 1,970 feet (0 to 600 meters). Blooms (Mar–May) Jun–Aug (Sep).	**Moderate.** Some marginal suitable habitat present within the study area at India Basin; recent documented occurrences in nearby San Bruno Mountain State Park.
San Francisco campion *Silene verecunda* ssp. *verecunda*	—/—/1B.2	Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland. Elevation ranges from 95 to 2,115 feet (30 to 645 meters). Blooms (Feb) Mar–Jun (Aug).	**Low.** Some marginal suitable habitat present within the study area; study area is outside the species' elevation range.
Santa Cruz microseris *Stebbinsoseris decipiens*	—/—/1B.2	Broadleafed upland forest, closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, valley and foothill grassland; open areas, sometimes serpentine. Elevation ranges from 30 to 1,640 feet (10 to 500 meters). Blooms Apr–May.	**No potential.** Suitable habitat not present within the study area.
California seablite *Suaeda californica*	FE/—/1B.1	Marshes and swamps (coastal salt). Elevation ranges from 0 to 50 feet (0 to 15 meters). Blooms Jul–Oct.	**High.** There are multiple recent documented occurrences around India Basin where the species has been reintroduced.
Two-fork clover *Trifolium amoenum*	FE/—/1B.1	Coastal bluff scrub, valley and foothill grassland (sometimes serpentine). Elevation ranges from 15 to 1,360 feet (5 to 415 meters). Blooms Apr–Jun.	**Low.** Not observed in San Francisco County since 1907.
Saline clover *Trifolium hydrophilum*	—/—/1B.2	Marshes and swamps, valley and foothill grassland (mesic, alkaline), vernal pools. Elevation ranges from 0 to 985 feet (0 to 300 meters). Blooms Apr–Jun.	**Low.** No documented occurrences in San Francisco County; however tidal marsh within the study area at India Basin provides potentially suitable habitat.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
San Francisco owl's-clover *Triphysaria floribunda*	—/—/1B.2	Coastal grassland and serpentine slopes. Elevation ranges from 0 to 600 feet (0 to 200 meters). Blooms Apr–Jun.	**Low.** Grassland present within the study area only provides marginal suitable habitat. Many of the occurrences within the area have been extirpated.
Coastal triquetrella *Triquetrella californica*	—/—/1B.2	Coastal bluff scrub, coastal scrub. Elevation ranges from 30 to 330 feet (10 to 100 meters).	**Moderate.** Coastal scrub present in the study area at India Basin may provide marginal suitable habitat; several recent nearby documented occurrences.
Oval-leaved viburnum *Viburnum ellipticum*	—/—/2B.3	Chaparral, cismontane woodland, lower montane coniferous forest. Elevation ranges from 525 to 2,360 feet (160 to 720 meters). Blooms May–Jun.	**No potential.** Suitable habitat not present within the study area; study area is outside the species' elevation range.
INVERTEBRATES			
Obscure bumble bee *Bombus caliginosus*	—/*/IUCN: VU	Coastal areas from Santa Barabara county to north to Washington state. Food plant genera include Baccharis, Cirsium, Lupinus, Lotus, Grindelia and Phacelia.	**Low.** Very limited habitat supporting this species' food plants is present at Heron's Head Park and around India Basin. Nearest recorded CNDDB occurrence is 2.9 miles away, near Baker Beach.
Crotch bumble bee *Bombus crotchii*	—/SC/IUCN: EN	Inhabits open grassland and scrub habitats. Nests are often located underground in abandoned rodent nests, or above ground in tufts of grass, old bird nests, rock piles, or cavities in dead trees. Food plants include the following families of native plants: Asclepias, Chaenactis, Lupinus, Medicago, Phacelia, and Salvia.	**Low.** Very limited habitat could be present at Heron's Head Park and around India Basin.
Western bumble bee *Bombus occidentalis*	—/SC/XSIC: IM	Inhabits open grassy areas, urban parks and gardens, chaparral and shrub areas, and mountain meadows. Generalist forager that visits wide variety of plants. *B. occidentalis* records are primarily associated with plants in the Leguminosae (=Fabaceae), Compositae (=Asteraceae), Rhamnaceae, and Rosaceae families.	**Low.** Food plants present in study area but in limited quantities (Heron's Head and India Basin). One CNDDB occurrence record from 1971 approximately 2.9 miles from the study area.
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE/—/—	Serpentine grasslands with larval host plants dwarf plantain (*Plantago erectis*) and purple owl's clover (*Castilleja exserta* ssp. *exerta*).	**No potential.** Suitable habitat not present within the study area. Nearest CNDDB occurrence is at San Bruno Mountain, approximately 3 miles from the study area.

Common Name ***Scientific Name***	**Status**	**General Habitat Requirements**	**Potential for Species Occurrence**
Monarch butterfly – California overwintering population *Danaus plexippus*	—/*/—	Eucalyptus groves (wintering sites).	**No potential.** Species was documented in 2014 at Fort Mason, approximately 0.15 miles west of the project site; however, suitable habitat not present within the study area.
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT/—/—	Serpentine grasslands with larval host plants dwarf plantain (*Plantago erectis*) and purple owl's clover (*Castilleja exserta* ssp. *exerta*).	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
Mission blue butterfly *Plebejus icarioides missionensis*	FE/—/—	Grassland with *Lupinus albifrons*, *L. formosa*, and *L. varicolor*.	**Low.** Marginally suitable habitat could be present at India Basin in the study area. CNDDB occurrence record from 2010 in Bayview Park, approximately 1.5 miles from the study area.
Callippe silverspot butterfly *Speyeria callippe callippe*	FE/—/—	Found in native grasslands with *Viola pedunculata* as larval food plant.	**No potential.** Marginally suitable habitat could be present at India Basin in the study area. CNDDB occurrence record from 2010 in Bayview Park, approximately 1.5 miles from the study area.
Myrtle's silverspot butterfly *Speyeria zerene myrtleae*	FE/—/—	Host plants include *Grindelia hirsutula, Abronia latifolia, Mondardella, Cirsium vulgare, and Erigeron glaucus* where found on the San Francisco and Marin peninsulas.	**No potential.** Site conditions are not conducive to supporting host plants; therefore, this species is not expected on site. No CNDDB occurrence records within 3 miles of the study area.
FISH AND MARINE MAMMALS			
Green Sturgeon (Southern DPS) *Acipenser medirostris*	FT/SSC/—	Marine and estuarine environments and Sacramento River; All of San Francisco Bay-Delta.	**Moderate.** This species migrates from the Pacific Ocean to spawning habitat in the Sacramento River watershed but may forage in or near the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Pacific herring (*Clupea pallasii*)	CDFW-managed species under the MLMA	Spawns in estuaries and bays, including along Oakland and San Francisco waterfronts, where it attaches egg masses to eelgrass, seaweed, pilings, breakwater rubble, and other hard surfaces. Juveniles congregate in San Francisco Bay during summer before moving into deeper waters in fall.	**Moderate.** Species spawning is documented to occur within 8 miles of the study area and suitable habitat is present in the study area for juveniles.
Central Valley steelhead DPS *Oncorhynchus mykiss*	FT/—	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds.	**Low.** No foraging or spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the marine study area. There is a low potential for incidental occurrence of this species if individuals stray from migration routes.
Central California coast DPS steelhead *Oncorhynchus mykiss*	FT/SSC/—	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from Ocean through San Francisco Bay-Delta to freshwater spawning grounds.	**Moderate.** No foraging or spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the marine study area. There is a low potential for incidental occurrence of this species if individuals are lost or swept into the area by currents.
Central Valley spring-run ESU Chinook salmon *O. tshawytscha*	FT/ST/—	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the project site. There is a low potential for incidental occurrence of this species if individuals stray from migration routes.
Sacramento River winter-run ESU Chinook salmon *O. tshawytscha*	FE/SE/—	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from ocean through San Francisco Bay-Delta to freshwater spawning grounds.	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the project site. There is a low potential for incidental occurrence of this species if individuals stray from migration routes.
Sacramento River fall/late-fall run Chinook salmon *O. tshawytscha*	FSC/—	Ocean waters, Sacramento and San Joaquin Rivers; Migrates from Ocean through San Francisco Bay-Delta to freshwater spawning grounds.	**Low.** No foraging of spawning habitat for this species is present. No streams supporting spawning runs are present within or in the vicinity of the project site. There is a low potential for incidental occurrence of this species if individuals stray from migration routes.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Longfin smelt *Spirinchus thaleichthys*	FC/ST/—	Throughout the nearshore coastal waters and open waters of San Francisco Bay-Delta including the river channels and sloughs of the Delta.	**High.** This species is documented to inhabit the deep channels of Central Bay for most of the year, including the waters adjacent to the project site.
Pacific harbor seal *Phoca vitulina richardii*	P/—	Coastal waters, and throughout Bay-Delta. Frequently hauls out on intertidal rocks, tidal mudflats and sandy beaches.	**Moderate.** Species frequents the waters of the San Francisco shoreline.
Harbor porpoise *Phocoena phocoena*	P/—	An inshore species inhabiting shallow, coastal waters and occasional large rivers, including San Francisco Bay-Delta Nearshore waters, particularly bays, estuaries, harbors, and fjords less than 600 feet (200 m) deep. Range in the Pacific extends from as far north as the Bering Sea, Alaska, as far south as Point Conception, California.	**Moderate.** The resident population has been steadily increasing in numbers and extending its foraging range within the Bay beyond the waters between the Golden Gate and Alcatraz Island. Observations have been made as far north as the Napa River mouth to the north and the Oakland-San Francisco Bay Bridge to the south.
California sea lion *Zalophus californianus*	P/—	Coastal waters, and throughout Bay-Delta. Hauls out on islands, natural; mainland areas, and man-made structures. Primary breeding sites in California are Año Nuevo State Park and the Channel Islands. No breeding sites exist in San Francisco Bay.	**Present.** Species regularly hauls-out on K docks at Pier 39, which is the only known haul-out site in San Francisco Bay. Species frequents the waters of the San Francisco shoreline, predominantly in west Central Bay, but will forage throughout the Bay.
REPTILES			
Western pond turtle *Actinemys marmorata*	—/SSC/—	Ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Requires basking sites and suitable upland habitat for egg-laying. Nest sites most often characterized as having gentle slopes (<15%) with little vegetation or sandy banks.	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
Green sea turtle *Chelonia mydas*	FT/—/—	Range in the eastern North Pacific Ocean from Baja California to Alaska, most commonly from San Diego South. When in nearshore foraging grounds, turtles feed on seagrasses and algae.	**Low.** Unlikely to occur in San Francisco Bay along the project site. No CNDDB occurrence records within 3 miles of the study area.
Alameda whipsnake *Coluber lateralis euryxanthus*	FT/ST/—	Coastal ranges, in chaparral and riparian habitat and adjacent grasslands.	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE/SE,FP/—	Densely vegetated ponds near open hillsides with abundant small mammal burrows.	**No potential.** Suitable habitat not present within the study area. Occurrences of this species are non-specific but are located in the San Francisco South and Montara Mountain USGS quadrangles.
AMPHIBIANS			
California tiger salamander *Ambystoma californiense*	FT/ST/—/	Vernal or temporary pools in annual grasslands, or open stages of woodlands. Typically, adults use mammal burrows for aestivation in non-breeding season.	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
California giant salamander *Dicamptodon ensatus*	—/SSC/—	Wet coastal forests in or near cold, permanent and semi-permanent streams and seepages.	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
Foothill yellow-legged frog *Rana boylii*	—/SC/—	Partly shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Needs at least some cobble-sized substrate for egg-laying. Needs at least 15 weeks to attain metamorphosis.	**No potential.** Suitable habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
California red-legged frog *Rana draytonii*	FT/SSC/—	Freshwater ponds and slow streams with emergent vegetation for egg attachment. Requires 11–20 weeks of permanent water for larval development. Must have access to estivation habitat.	**No potential.** Suitable habitat not present within the study area. Nearest occurrences are in ponds in Golden Gate Park, approximately 3.7 miles away.
BIRDS			
Cooper's hawk *Accipiter cooperii*	—/WL/—	Nests in riparian areas and oak woodlands, and hunts songbirds at woodland edges. Increasingly found nesting in neighborhood street trees.	**Low.** Riparian habitat not present in the study area; however, marginally suitable habitat could be present in mature trees in a park setting. No CNDDB occurrence records within 3 miles of the study area.
Marbled Murrelet *Brachyramphus marmoratus*	FT/SE/—	Feeds near-shore; nests inland along coast from Eureka to Oregon border and from Half Moon Bay to Santa Cruz. Nests in old-growth redwood-dominated forests, up to six miles inland, often in Douglas-fir.	**Low (no nesting potential).** No suitable nesting habitat within the study area. Unlikely to occur in San Francisco Bay. No CNDDB occurrence records within 3 miles of the study area.

Common Name ***Scientific Name***	**Status**	**General Habitat Requirements**	**Potential for Species Occurrence**
Western snowy plover *Charadrius alexandrinus nivosus*	FT/SSC/—	Sandy beaches, salt pond levels and shores of alkali lakes. Needs sandy, gravelly or friable soils for nesting.	**Moderate (low nesting potential).** Limited suitable nesting habitat within the study area include the public beach at Aquatic Park and coastal dunes near India Basin. No CNDDB occurrence records within 3 miles of the study area.
Northern harrier *Circus husonius*	—/SSC/—	Nests in coastal freshwater and saltwater marshes, nest and forages in grasslands.	**No potential.** Suitable breeding and foraging habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
Yellow rail *Coturnicops noveboracensis*	—/SSC/—	Nests on damp ground or up to 15 cm above ground among grasses and sedges near shallow marshes and wet meadows, where only the highest tides inundate.	**No potential.** Suitable breeding and foraging habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
White-tailed kite *Elanus leucuruss*	—/FP/—	Nests in low elevation grassland, agricultural, wetland, oak woodland or savannah habitats. Nest tree/shrub species extremely variable from shrubs <3-meter-tall (e.g., *Atriplex* and *Baccharis*) to large trees >50-meter-tall (e.g., *Sequoia sempervirens* and *Picea sitchensis*).	**No potential.** Suitable breeding and foraging habitat not present within the study area. No CNDDB occurrence records within 3 miles of the study area.
American peregrine falcon *Falco peregrines anatum*	FDL/SDL, FP/—	Breeds near water at varied nest sites, including natural cliff ledges and potholes, tall metropolitan buildings and bridges, and former nests of common raven and osprey on electric transmission towers and boat navigation channel markers (towers).	**Moderate.** Suitable nesting habitat is present within the study area on cranes or other tall structures at the waterfront. Peregrines were documented to attempt nesting at Pier 80 in 2020; however, they abandoned the nest early in the nesting cycle.
Salt marsh common yellowthroat *Geothlypis trichas sinuosa*	—/SSC/—	Resident of the San Francisco Bay region, in fresh and salt water marshes. Requires thick, continuous cover down to water surface for foraging; tall grasses, tule patches, willows for nesting.	**No potential.** Suitable habitat not present within the study area. CNDDB occurrence record from Lake Merced; however, no CNDDB occurrence records within 3 miles of the study area.
Caspian tern *Hydroprogne caspia*	—/*/—	Colonial nester on sandy estuarine shores, on levees in salt ponds, and on islands in alkali and freshwater lake. May fly substantial distances to forage in lacustrine, riverine, and fresh and saline emergent wetland habitats.	**Moderate.** Species has been documented nesting successfully at Piers 60 and 64 within the study area; however, there are no CNDDB occurrence records within 3 miles of the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
California black rail *Laterallus jamaicensis coturniculus*	—/ST, FP/—	Salt and brackish marshes; also in freshwater marshes at low elevations.	**No potential.** Suitable habitat not present within the study area. A CNDDB occurrence (possibly extirpated) is recorded from the late 1800s at what is now Crissy Field; and an occurrence is recorded from 1942 at Mountain Lake Park, approximately 2.9 miles from the study area.
Alameda song sparrow *Melospiza melodia pusillula*	—/SSC/—	Salt marshes of eastern and south San Francisco Bay. Inhabits Salicornia marshes; nests low in Grindelia bushes (high enough to escape high tides) and in Salicornia.	**Low.** Marginally suitable habitat may be present in marshes within the study area. No CNDDB occurrence records within 3 miles of the study area.
Osprey *Pandion haliaetus*	—/WL/—	Found around nearly any water body, including salt marshes, rivers, ponds, reservoirs, estuaries, and oceans. Nests on tall human-made structures in view of water.	**High.** Nesting pair bred successfully on top of a crane at Pier 80 in 2012; cranes and other potential nesting sites occur within the study area and foraging habitat present in San Francisco Bay.
Double-crested cormorant *Phalacrocorax auritus*	—/WL/—	Rookery breeder in coastal areas and inland lakes in fresh, saline, and estuarine waters. Nests in trees and on human-made structures.	**Moderate.** Abundant in San Francisco Bay and documented to nest on the San Francisco-Oakland Bay Bridge and at Lake Merced. May forage off-shore of the study area. Trees in the study area offer nesting habitat.
Short-tailed albatross *Phoebastria (=Diomedea) albatrus*	FE/SSC/—	A pelagic species that spends most of its time at sea and returns to land only for breeding purposes.	**Low (no nesting potential).** Breeds only at one or two sites off the coast of Japan, occasional visitor to California coast and could appear on a transient basis offshore of the study area. No CNDDB occurrence records within 3 miles of the study area.
California Ridgway's rail *Rallus obsoletus obsoletus*	FE/ST, FP/—	Salt marsh wetlands with dense vegetation along the San Francisco Bay.	**Low.** Marginally suitable habitat is present at Heron's Head Park. One CNDDB occurrence is recorded from 2011 at Heron's Head Park; however, surveys conducted by ESA at Heron's Head Park between 2020 and 2021 have resulted in no detections of this species.
Bank swallow *Riparia riparia (nesting)*	—/ST/—	Vertical banks and cliffs with sandy soil, near water. Nests in holes dug in cliffs and river banks.	**Low (no nesting potential).** No suitable nesting habitat in the study area. Species may occur on a transient basis while foraging. CNDDB occurrence record from Ocean Beach; however, no CNDDB occurrence records within 3 miles of the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
California least tern *Sternula antillarum browni*	FE/SE, FP/—	Nests along the coast from San Francisco Bay south to northern Baja California. Colonial breeder on bare or sparsely vegetated, flat substrates: sand beaches, alkali flats, landfills, or paved areas.	**Moderate (low nesting potential).** Forages near the Bay shoreline. The Project site shoreline is nearly completely armored with riprap and seawalls. Unvegetated areas along the shoreline provide limited low quality nesting habitat. No CNDDB occurrence records within 3 miles of the study area.
MAMMALS			
Pallid bat *Antrozous pallidus*	— /SSC/WBWG: High	Roosts in crevices in cliffs, buildings or bridges in areas adjacent to open space for foraging. Occurs across California; associated with lower elevations.	**Moderate.** Roosting habitat present in abandoned buildings on the waterfront, under bridges at Mission or Islais Creek, or in mature park trees. No CNDDB occurrence records within 3 miles of the study area.
Townsend's big-eared bat *Corynorhinus townsendii*	— /CSC/WBWG: High	Throughout California in a wide variety of habitats. Most common in mesic sites. Roosts in the open, hanging from walls and ceilings of rocky areas with caves or tunnels. Roosting sites limited. Extremely sensitive to human disturbance.	**No potential.** No suitable habitat within the study area. One CNDDB occurrence record from 2005 approximately 3.5 miles away.
North American porcupine *Erethizon dorsatum*	—/*/—	Forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges. Wide variety of coniferous and mixed woodland habitat.	**No potential.** No suitable habitat within the study area. No CNDDB occurrence records within 3 miles of the study area.
Western red bat *Lasiurus blossevillii*	— /SSC/WBWG: High	Solitary rooster in tree foliage. May hibernate in leaf litter. Habitats include forests and woodlands from sea level up through mixed conifer forests. Feeds over a wide variety of habitats including grasslands, shrublands, open water, open woodlands and forests, and croplands. Absent from desert areas. Migrants can be found outside.	**No potential.** No suitable habitat within the study area. No CNDDB occurrence records within 3 miles of the study area.
Hoary bat *Lasiurus cinereus*	—/—/WBWG: Medium	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. Roosts in dense foliage of medium to large trees. Feeds primarily on moths; requires water. Could forage over San Francisco Bay.	**Low.** Limited suitable habitat within the study area. One CNDDB record within 3 miles of the study area is from 1951 approximately 1.3 miles from the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence
Yuma myotis *Myotis yumanensis*	—/*/—	Roost in crevices in buildings, under bridges, in caves or mines, and in tree bark. Forage over open water. Present throughout most of California with the exception of the southeast portion of the state.	**Moderate.** Could roost in abandoned buildings on the waterfront, under bridges at Mission or Islais Creek, or in mature park trees. No CNDDB occurrence records within 3 miles of the study area.
Big free-tailed bat *Nyctinomops macrotis*	— /SSC/WBWG: Medium-High	Low-lying arid areas in Southern California. Prefer habitats with rugged, rocky terrain up to 8,000 feet elevation. Need high cliffs or rocky outcrops for roosting sites. Feeds principally on large moths.	**No potential.** No suitable habitat within the study area. No CNDDB occurrence records within 3 miles of the study area.
Salt marsh harvest mouse *Reithrodontomys raviventris*	FE/SE, FP/—	Only in the saline emergent wetlands of San Francisco Bay and its tributaries. 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.	**No potential.** No suitable habitat within the study area. Saltmarsh habitat is extremely limited and fragmented. No CNDDB occurrence records within 3 miles of the study area.
Angel Island mole *Scapanus latimanus insularis*	—/*/—	Scientific information is absent for this species. Presumed endemic to Angel Island and inhabiting similar habitats as other sub-species of *Scapanus latimanus*, including annual and perennial grasslands and other habitats with moist, friable soils.	**No potential.** Outside of species' known distribution. No CNDDB occurrence records within 3 miles of the study area.
Alameda Island mole *Scapanus latimanus parvus*	—/SSC/—	Only known from Alameda Island. Found in a variety of habitats, especially annual and perennial grasslands. Prefers moist, friable soils. Avoids flooded soils.	**No potential.** Outside of species' known distribution. No CNDDB occurrence records within 3 miles of the study area.
American badger *Taxidea taxus*	—/SSC/—	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**No potential.** No suitable habitat within the study area. No CNDDB occurrence records within 3 miles of the study area.
Point Reyes jumping mouse *Zapus trinotatus orarius*	—/SSC/—	Inhabits dense plant cover, such as streamsides, thickets, moist fields and some woodlands. Range is restricted to west side of Marin County.	**No potential.** Outside of species' known distribution. No CNDDB occurrence records within 3 miles of the study area.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence

SOURCE: Data compiled by Environmental Science Associates in 2019 and 2020.

NOTES:

CNDDB = California Natural Diversity Database

[a] The California Department of Fish and Wildlife (CDFW), the agency responsible for determining California Rare Plant Rank (CRPR) plant rankings, does not recognize a ranking status for the northern California black walnut, as the species is not named on CDFW's October 2019 *Special Vascular Plants, Bryophytes, and Lichens List*; however, the California Native Plant Society (CNPS) recognizes this tree as a Rank 1B.1 (rare, threatened, or endangered in California and elsewhere; seriously threatened in California). There is a current widespread distribution in Northern California and southern Oregon of trees that match *J. hindsii* morphologically, previously thought to be hybrids. Recent findings show that most of these occurrences are genetically pure *J. hindsii*.[1] There are only three or four sites (in Contra Costa, Sacramento, and Napa Counties) where the species is known to have occurred before the extensive settlement of California by Europeans in the mid-19th century, which has served as the exclusive justification for CNPS designating a rare plant rank of 1B.1. This now-known widespread distribution of genetically pure *J. hindsii* suggests that the CNPS rare plant rank of 1B.1 is not appropriate.

KEY:

STATUS: Federal/State/Other (CNPS CRPR, Western Bat Working Group, Xerces Society for Invertebrate Conservation)

Federal (U.S. Fish and Wildlife Service)

FDL = delisted
FE = listed as endangered (in danger of extinction) by the federal government
FT = listed as threatened (likely to become endangered within the foreseeable future) by the federal government
FC = candidate to become a *proposed* species
BGEPA = Bald and Golden Eagle Protection Act
MMPA = Marine Mammal Protection Act

State (CDFW)

SE = listed as endangered by the State of California
ST = listed as threatened by the State of California
SC = state candidate for listing
* = Special Animals List

SSC = California Species of Special Concern
FP = state fully protected
SDL = delisted
SR = state rare (plants)

Other

California Native Plant Society (CNPS) California Rare Plant Rank (CRPR)

1A = Presumed extirpated in California; Rare or extinct in other parts of its range.
1B = Rare, threatened, or endangered throughout range; Most species in this rank are endemic to California.
2A = Extirpated in California, but common in other parts of its range.
2B = Rare, threatened, or endangered in California but common in other parts of its range.

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

Xerces Society for Invertebrate Conservation (XSIC)

CI = Critically imperiled
IM = Imperiled
VU = Vulnerable
DD = Data Deficit

International Union for Conservation of Nature (IUCN) Red List

LC = Least concern
NT = Near threatened
VU = Vulnerable
EN = Endangered
CR = Critically endangered

[1] Potter, D., H. Bartosh, G. Dangl, J. Yang, R. Bittman, et. al., Clarifying the Conservation Status of Northern California Black Walnut (*Juglans hindsii*) Using Microsatellite Markers, *Madroño*, 65(3):131–140, 2018.

Common Name *Scientific Name*	Status	General Habitat Requirements	Potential for Species Occurrence

Western Bat Working Group (WBWG)

Low = Stable population
Medium = Need more information about the species, possible threats, and protective actions to implement
High = Imperiled or at high risk of imperilment

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H2 CDFW California Natural Diversity Database

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (San Francisco North (3712274) OR Point Bonita (3712275) OR Oakland West (3712273))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Accipiter cooperii Cooper's hawk	ABNKC12040	None	None	G5	S4	WL
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Amsinckia lunaris bent-flowered fiddleneck	PDBOR01070	None	None	G3	S3	1B.2
Antrozous pallidus pallid bat	AMACC10010	None	None	G4	S3	SSC
Arctostaphylos franciscana Franciscan manzanita	PDERI040J3	Endangered	None	GHC	S1	1B.1
Arctostaphylos montana ssp. ravenii Presidio manzanita	PDERI040J2	Endangered	Endangered	G3T1	S1	1B.1
Arenaria paludicola marsh sandwort	PDCAR040L0	Endangered	Endangered	G1	S1	1B.1
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	Candidate Endangered	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	Candidate Endangered	G2G3	S1	
Calystegia purpurata ssp. saxicola coastal bluff morning-glory	PDCON040D2	None	None	G4T2T3	S2S3	1B.2
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Carex praticola northern meadow sedge	PMCYP03B20	None	None	G5	S2	2B.2
Chloropyron maritimum ssp. palustre Point Reyes salty bird's-beak	PDSCR0J0C3	None	None	G4?T2	S2	1B.2
Chorizanthe cuspidata var. cuspidata San Francisco Bay spineflower	PDPGN04081	None	None	G2T1	S1	1B.2
Chorizanthe robusta var. robusta robust spineflower	PDPGN040Q2	Endangered	None	G2T1	S1	1B.1
Cicindela hirticollis gravida sandy beach tiger beetle	IICOL02101	None	None	G5T2	S2	
Circus hudsonius northern harrier	ABNKC11011	None	None	G5	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Cirsium andrewsii Franciscan thistle	PDAST2E050	None	None	G3	S3	1B.2
Cirsium hydrophilum var. vaseyi Mt. Tamalpais thistle	PDAST2E1G2	None	None	G2T1	S1	1B.2
Clarkia franciscana Presidio clarkia	PDONA050H0	Endangered	Endangered	G1	S1	1B.1
Collinsia corymbosa round-headed Chinese-houses	PDSCR0H060	None	None	G1	S1	1B.2
Collinsia multicolor San Francisco collinsia	PDSCR0H0B0	None	None	G2	S2	1B.2
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G4	S2	SSC
Coturnicops noveboracensis yellow rail	ABNME01010	None	None	G4	S1S2	SSC
Danaus plexippus pop. 1 monarch - California overwintering population	IILEPP2012	Candidate	None	G4T2T3	S2S3	
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Enhydra lutris nereis southern sea otter	AMAJF09012	Threatened	None	G4T2	S2	FP
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Eucyclogobius newberryi tidewater goby	AFCQN04010	Endangered	None	G3	S3	
Eumetopias jubatus Steller (=northern) sea-lion	AMAJC03010	Delisted	None	G3	S2	
Euphydryas editha bayensis Bay checkerspot butterfly	IILEPK4055	Threatened	None	G5T1	S1	
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco peregrinus anatum American peregrine falcon	ABNKD06071	Delisted	Delisted	G4T4	S3S4	FP
Fritillaria lanceolata var. tristulis Marin checker lily	PMLIL0V0P1	None	None	G5T2	S2	1B.1
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Geothlypis trichas sinuosa saltmarsh common yellowthroat	ABPBX1201A	None	None	G5T3	S3	SSC

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Gilia capitata ssp. chamissonis blue coast gilia	PDPLM040B3	None	None	G5T2	S2	1B.1
Gilia millefoliata dark-eyed gilia	PDPLM04130	None	None	G2	S2	1B.2
Gonidea angulata western ridged mussel	IMBIV19010	None	None	G3	S1S2	
Grindelia hirsutula var. maritima San Francisco gumplant	PDAST470D3	None	None	G5T1Q	S1	3.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T2	S2	1B.2
Hesperolinon congestum Marin western flax	PDLIN01060	Threatened	Threatened	G1	S1	1B.1
Heteranthera dubia water star-grass	PMPON03010	None	None	G5	S2	2B.2
Holocarpha macradenia Santa Cruz tarplant	PDAST4X020	Threatened	Endangered	G1	S1	1B.1
Horkelia cuneata var. sericea Kellogg's horkelia	PDROS0W043	None	None	G4T1?	S1?	1B.1
Horkelia marinensis Point Reyes horkelia	PDROS0W0B0	None	None	G2	S2	1B.2
Hypogymnia schizidiata island tube lichen	NLT0032640	None	None	G2G3	S2	1B.3
Lasiurus blossevillii western red bat	AMACC05060	None	None	G4	S3	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G3G4	S4	
Laterallus jamaicensis coturniculus California black rail	ABNME03041	None	Threatened	G3G4T1	S1	FP
Layia carnosa beach layia	PDAST5N010	Endangered	Endangered	G2	S2	1B.1
Leptosiphon rosaceus rose leptosiphon	PDPLM09180	None	None	G1	S1	1B.1
Lessingia germanorum San Francisco lessingia	PDAST5S010	Endangered	Endangered	G1	S1	1B.1
Lichnanthe ursina bumblebee scarab beetle	IICOL67020	None	None	G2	S2	
Melospiza melodia pusillula Alameda song sparrow	ABPBXA301S	None	None	G5T2?	S2S3	SSC
Melospiza melodia samuelis San Pablo song sparrow	ABPBXA301W	None	None	G5T2	S2	SSC
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Northern Coastal Salt Marsh	CTT52110CA	None	None	G3	S3.2	
Northern Coastal Salt Marsh						
Nyctinomops macrotis	AMACD04020	None	None	G5	S3	SSC
big free-tailed bat						
Oncorhynchus kisutch pop. 4	AFCHA02034	Endangered	Endangered	G5T2T3Q	S2	
coho salmon - central California coast ESU						
Pentachaeta bellidiflora	PDAST6X030	Endangered	Endangered	G1	S1	1B.1
white-rayed pentachaeta						
Phalacrocorax auritus	ABNFD01020	None	None	G5	S4	WL
double-crested cormorant						
Plagiobothrys chorisianus var. chorisianus	PDBOR0V061	None	None	G3T1Q	S1	1B.2
Choris' popcornflower						
Plagiobothrys diffusus	PDBOR0V080	None	Endangered	G1Q	S1	1B.1
San Francisco popcornflower						
Plagiobothrys glaber	PDBOR0V0B0	None	None	GX	SX	1A
hairless popcornflower						
Plebejus icarioides missionensis	IILEPG801A	Endangered	None	G5T1	S1	
Mission blue butterfly						
Polemonium carneum	PDPLM0E050	None	None	G3G4	S2	2B.2
Oregon polemonium						
Polygonum marinense	PDPGN0L1C0	None	None	G2Q	S2	3.1
Marin knotweed						
Rallus obsoletus obsoletus	ABNME05011	Endangered	Endangered	G3T1	S1	FP
California Ridgway's rail						
Rana boylii	AAABH01050	None	Endangered	G3	S3	SSC
foothill yellow-legged frog						
Rana draytonii	AAABH01022	Threatened	None	G2G3	S2S3	SSC
California red-legged frog						
Reithrodontomys raviventris	AMAFF02040	Endangered	Endangered	G1G2	S1S2	FP
salt-marsh harvest mouse						
Riparia riparia	ABPAU08010	None	Threatened	G5	S2	
bank swallow						
Sanicula maritima	PDAPI1Z0D0	None	Rare	G2	S2	1B.1
adobe sanicle						
Scapanus latimanus insularis	AMABB02032	None	None	G5T1	SH	
Angel Island mole						
Scapanus latimanus parvus	AMABB02031	None	None	G5T1Q	SH	SSC
Alameda Island mole						
Silene scouleri ssp. scouleri	PDCAR0U1MC	None	None	G5T4T5	S2S3	2B.2
Scouler's catchfly						
Silene verecunda ssp. verecunda	PDCAR0U213	None	None	G5T1	S1	1B.2
San Francisco campion						

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Speyeria callippe callippe callippe silverspot butterfly	IILEPJ6091	Endangered	None	G5T1	S1	
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Stebbinsoseris decipiens Santa Cruz microseris	PDAST6E050	None	None	G2	S2	1B.2
Sternula antillarum browni California least tern	ABNNM08103	Endangered	Endangered	G4T2T3Q	S2	FP
Suaeda californica California seablite	PDCHE0P020	Endangered	None	G1	S1	1B.1
Taxidea taxus American badger	AMAJF04010	None	None	G5	S3	SSC
Trachusa gummifera San Francisco Bay Area leaf-cutter bee	IIHYM80010	None	None	G1	S1	
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Triphysaria floribunda San Francisco owl's-clover	PDSCR2T010	None	None	G2?	S2?	1B.2
Triquetrella californica coastal triquetrella	NBMUS7S010	None	None	G2	S2	1B.2
Tryonia imitator mimic tryonia (=California brackishwater snail)	IMGASJ7040	None	None	G2	S2	
Vespericola marinensis Marin hesperian	IMGASA4140	None	None	G2	S2	
Viburnum ellipticum oval-leaved viburnum	PDCPR07080	None	None	G4G5	S3?	2B.3
Zapus trinotatus orarius Point Reyes jumping mouse	AMAFH01031	None	None	G5T1T3Q	S1S3	SSC

Record Count: 96

H3 CNPS Inventory Results

CNPS California Native Plant Society

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

55 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712273 3712275 and 3712274;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	1B.2	S3	G3
Arabis blepharophylla	coast rockcress	Brassicaceae	perennial herb	Feb-May	4.3	S4	G4
Arctostaphylos franciscana	Franciscan manzanita	Ericaceae	perennial evergreen shrub	Feb-Apr	1B.1	S1	G1
Arctostaphylos montana ssp. ravenii	Presidio manzanita	Ericaceae	perennial evergreen shrub	Feb-Mar	1B.1	S1	G3T1
Arenaria paludicola	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	May-Aug	1B.1	S1	G1
Aspidotis carlotta-halliae	Carlotta Hall's lace fern	Pteridaceae	perennial rhizomatous herb	Jan-Dec	4.2	S3	G3
Astragalus nuttallii var. nuttallii	ocean bluff milk-vetch	Fabaceae	perennial herb	Jan-Nov	4.2	S4	G4T4
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	Convolvulaceae	perennial herb	(Mar)Apr-Sep	1B.2	S2S3	G4T2T3
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	2B.1	S2	G5
Carex praticola	northern meadow sedge	Cyperaceae	perennial herb	May-Jul	2B.2	S2	G5
Castilleja ambigua var. ambigua	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	Mar-Aug	4.2	S3S4	G4T4
Chloropyron maritimum ssp. palustre	Point Reyes bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Oct	1B.2	S2	G4?T2
Chorizanthe cuspidata var. cuspidata	San Francisco Bay spineflower	Polygonaceae	annual herb	Apr-Jul(Aug)	1B.2	S1	G2T1
Chorizanthe valida	Sonoma spineflower	Polygonaceae	annual herb	Jun-Aug	1B.1	S1	G1
Cirsium andrewsii	Franciscan thistle	Asteraceae	perennial herb	Mar-Jul	1B.2	S3	G3

Cirsium hydrophilum var. vaseyi	Mt. Tamalpais thistle	Asteraceae	perennial herb	May-Aug	1B.2	S1	G2T1
Clarkia franciscana	Presidio clarkia	Onagraceae	annual herb	May-Jul	1B.1	S1	G1
Collinsia corymbosa	round-headed Chinese-houses	Plantaginaceae	annual herb	Apr-Jun	1B.2	S1	G1
Collinsia multicolor	San Francisco collinsia	Plantaginaceae	annual herb	(Feb)Mar-May	1B.2	S2	G2
Eriophorum gracile	slender cottongrass	Cyperaceae	perennial rhizomatous herb (emergent)	May-Sep	4.3	S4	G5
Erysimum franciscanum	San Francisco wallflower	Brassicaceae	perennial herb	Mar-Jun	4.2	S3	G3
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Fritillaria lanceolata var. tristulis	Marin checker lily	Liliaceae	perennial bulbiferous herb	Feb-May	1B.1	S2	G5T2
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
Gilia capitata ssp. chamissonis	blue coast gilia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G5T2
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	Apr-Jul	1B.2	S2	G2
Grindelia hirsutula var. maritima	San Francisco gumplant	Asteraceae	perennial herb	Jun-Sep	3.2	S1	G5T1Q
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Asteraceae	annual herb	Apr-Nov	1B.2	S2	G5T2
Hesperolinon congestum	Marin western flax	Linaceae	annual herb	Apr-Jul	1B.1	S1	G1
Heteranthera dubia	water star-grass	Pontederiaceae	perennial herb (aquatic)	Jul-Oct	2B.2	S2	G5
Holocarpha macradenia	Santa Cruz tarplant	Asteraceae	annual herb	Jun-Oct	1B.1	S1	G1
Horkelia cuneata var. sericea	Kellogg's horkelia	Rosaceae	perennial herb	Apr-Sep	1B.1	S1?	G4T1?
Horkelia marinensis	Point Reyes horkelia	Rosaceae	perennial herb	May-Sep	1B.2	S2	G2
Hypogymnia schizidiata	island rock lichen	Parmeliaceae	foliose lichen (null)		1B.3	S1	G2
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May	4.2	S3	G3
Layia carnosa	beach layia	Asteraceae	annual herb	Mar-Jul	1B.1	S2	G2
Leptosiphon rosaceus	rose leptosiphon	Polemoniaceae	annual herb	Apr-Jul	1B.1	S1	G1
Lessingia germanorum	San Francisco lessingia	Asteraceae	annual herb	(Jun)Jul-Nov	1B.1	S1	G1
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	annual herb	Mar-May	3.2	S3S4	G3G4
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	Apr-Jun(Jul)	1B.2	S2	G2
Pentachaeta bellidiflora	white-rayed pentachaeta	Asteraceae	annual herb	Mar-May	1B.1	S1	G1
Plagiobothrys chorisianus var. chorisianus	Choris' popcornflower	Boraginaceae	annual herb	Mar-Jun	1B.2	S1	G3T1Q
Plagiobothrys diffusus	San Francisco popcornflower	Boraginaceae	annual herb	Mar-Jun	1B.1	S1	G1Q
Polemonium carneum	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	2B.2	S2	G3G4

Sanicula maritima	adobe sanicle	Apiaceae	perennial herb	Feb-May	1B.1	S2	G2
Silene scouleri ssp. scouleri	Scouler's catchfly	Caryophyllaceae	perennial herb	(Mar-May)Jun-Aug(Sep)	2B.2	S2S3	G5T4T5
Silene verecunda ssp. verecunda	San Francisco campion	Caryophyllaceae	perennial herb	(Feb)Mar-Jun(Aug)	1B.2	S1	G5T1
Spergularia macrotheca var. longistyla	long-styled sand-spurrey	Caryophyllaceae	perennial herb	Feb-May(Jun)	1B.2	S2	G5T2
Stebbinsoseris decipiens	Santa Cruz microseris	Asteraceae	annual herb	Apr-May	1B.2	S2	G2
Suaeda californica	California seablite	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	1B.1	S1	G1
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2
Triphysaria floribunda	San Francisco owl's-clover	Orobanchaceae	annual herb	Apr-Jun	1B.2	S2?	G2?
Triquetrella californica	coastal triquetrella	Pottiaceae	moss		1B.2	S2	G2
Viburnum ellipticum	oval-leaved viburnum	Adoxaceae	perennial deciduous shrub	May-Jun	2B.3	S3?	G4G5

Suggested Citation

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Questions and Comments
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H4 USFWS IPaC Threatened and Endangered Species, Sacramento Fish and Wildlife Office

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: April 13, 2021
Consultation Code: 08ESMF00-2021-SLI-1535
Event Code: 08ESMF00-2021-E-04499
Project Name: Port of San Francisco Waterfront Plan EIR

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to

utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

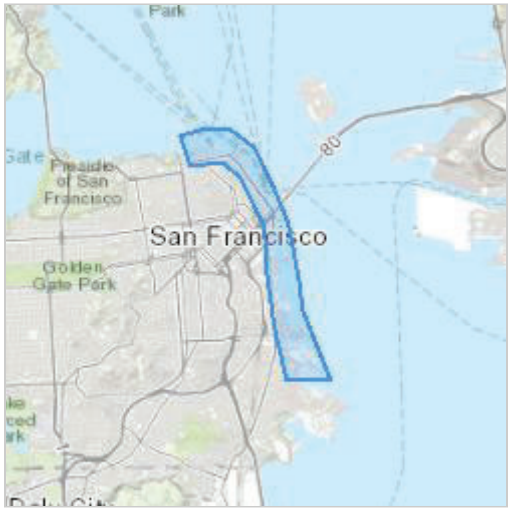
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

Project Summary

Consultation Code: 08ESMF00-2021-SLI-1535
Event Code: 08ESMF00-2021-E-04499
Project Name: Port of San Francisco Waterfront Plan EIR
Project Type: SHORELINE USAGE FACILITIES / DEVELOPMENT
Project Description: Redevelopment, repair, and construction at various sites along the Port of San Francisco waterfront properties on the east side of San Francisco.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.775181950000004,-122.38524977594483,14z



Counties: San Francisco County, California

Endangered Species Act Species

There is a total of 28 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered
Southern Sea Otter *Enhydra lutris nereis* No critical habitat has been designated for this species. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/8560	Threatened

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Bay Checkerspot Butterfly *Euphydryas editha bayensis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2320	Threatened
Callippe Silverspot Butterfly *Speyeria callippe callippe* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3779	Endangered
Mission Blue Butterfly *Icaricia icarioides missionensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6928	Endangered
Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6929	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Flowering Plants

NAME	STATUS
California Seablite *Suaeda californica* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6310	Endangered
Franciscan Manzanita *Arctostaphylos franciscana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5350	Endangered
Marin Dwarf-flax *Hesperolinon congestum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Marsh Sandwort *Arenaria paludicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2229	Endangered
Presidio Clarkia *Clarkia franciscana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3890	Endangered
Presidio Manzanita *Arctostaphylos hookeri var. ravenii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7216	Endangered
Robust Spineflower *Chorizanthe robusta var. robusta* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/9287	Endangered
San Francisco Lessingia *Lessingia germanorum (=L.g. var. germanorum)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8174	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

H5 USFWS IPaC Threatened and Endangered Species, San Francisco Bay-Delta Fish and Wildlife

United States Department of the Interior

FISH AND WILDLIFE SERVICE
San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
Phone: (916) 930-5603 Fax: (916) 930-5654
http://kim_squires@fws.gov

In Reply Refer To: April 13, 2021
Consultation Code: 08FBDT00-2021-SLI-0139
Event Code: 08FBDT00-2021-E-00332
Project Name: Port of San Francisco Waterfront Plan EIR

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

San Francisco Bay-Delta Fish And Wildlife
650 Capitol Mall
Suite 8-300
Sacramento, CA 95814
(916) 930-5603

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

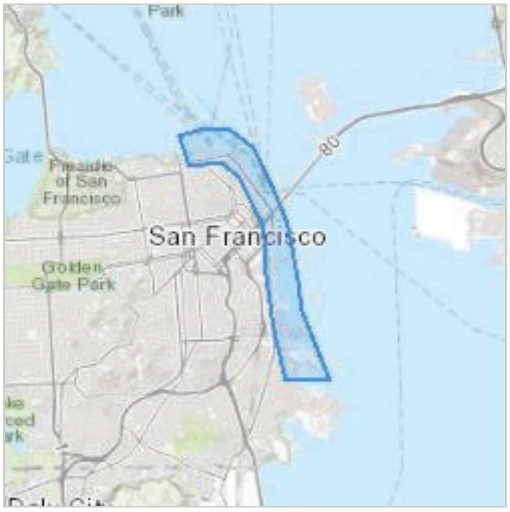
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08FBDT00-2021-SLI-0139
Event Code: 08FBDT00-2021-E-00332
Project Name: Port of San Francisco Waterfront Plan EIR
Project Type: SHORELINE USAGE FACILITIES / DEVELOPMENT
Project Description: Redevelopment, repair, and construction at various sites along the Port of San Francisco waterfront properties on the east side of San Francisco.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.775181950000004,-122.38524977594483,14z



Counties: San Francisco County, California

Endangered Species Act Species

There is a total of 29 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered
Southern Sea Otter *Enhydra lutris nereis* No critical habitat has been designated for this species. ***This species is also protected by the Marine Mammal Protection Act, and may have additional consultation requirements.*** Species profile: https://ecos.fws.gov/ecp/species/8560	Threatened

Birds

NAME	STATUS
California Clapper Rail *Rallus longirostris obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
California Least Tern *Sterna antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Short-tailed Albatross *Phoebastria (=Diomedea) albatrus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/433	Endangered
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

Reptiles

NAME	STATUS
Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5524	Threatened
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Insects

NAME	STATUS
Bay Checkerspot Butterfly *Euphydryas editha bayensis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2320	Threatened
Callippe Silverspot Butterfly *Speyeria callippe callippe* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3779	Endangered
Mission Blue Butterfly *Icaricia icarioides missionensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6928	Endangered
Myrtle's Silverspot Butterfly *Speyeria zerene myrtleae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6929	Endangered
San Bruno Elfin Butterfly *Callophrys mossii bayensis* There is **proposed** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/3394	Endangered

Flowering Plants

NAME	STATUS
California Seablite *Suaeda californica* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6310	Endangered
Franciscan Manzanita *Arctostaphylos franciscana* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5350	Endangered
Marin Dwarf-flax *Hesperolinon congestum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5363	Threatened
Marsh Sandwort *Arenaria paludicola* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2229	Endangered
Presidio Clarkia *Clarkia franciscana* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3890	Endangered
Presidio Manzanita *Arctostaphylos hookeri var. ravenii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7216	Endangered
Robust Spineflower *Chorizanthe robusta var. robusta* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/9287	Endangered
San Francisco Lessingia *Lessingia germanorum (=L.g. var. germanorum)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8174	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered
White-rayed Pentachaeta *Pentachaeta bellidiflora* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7782	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.