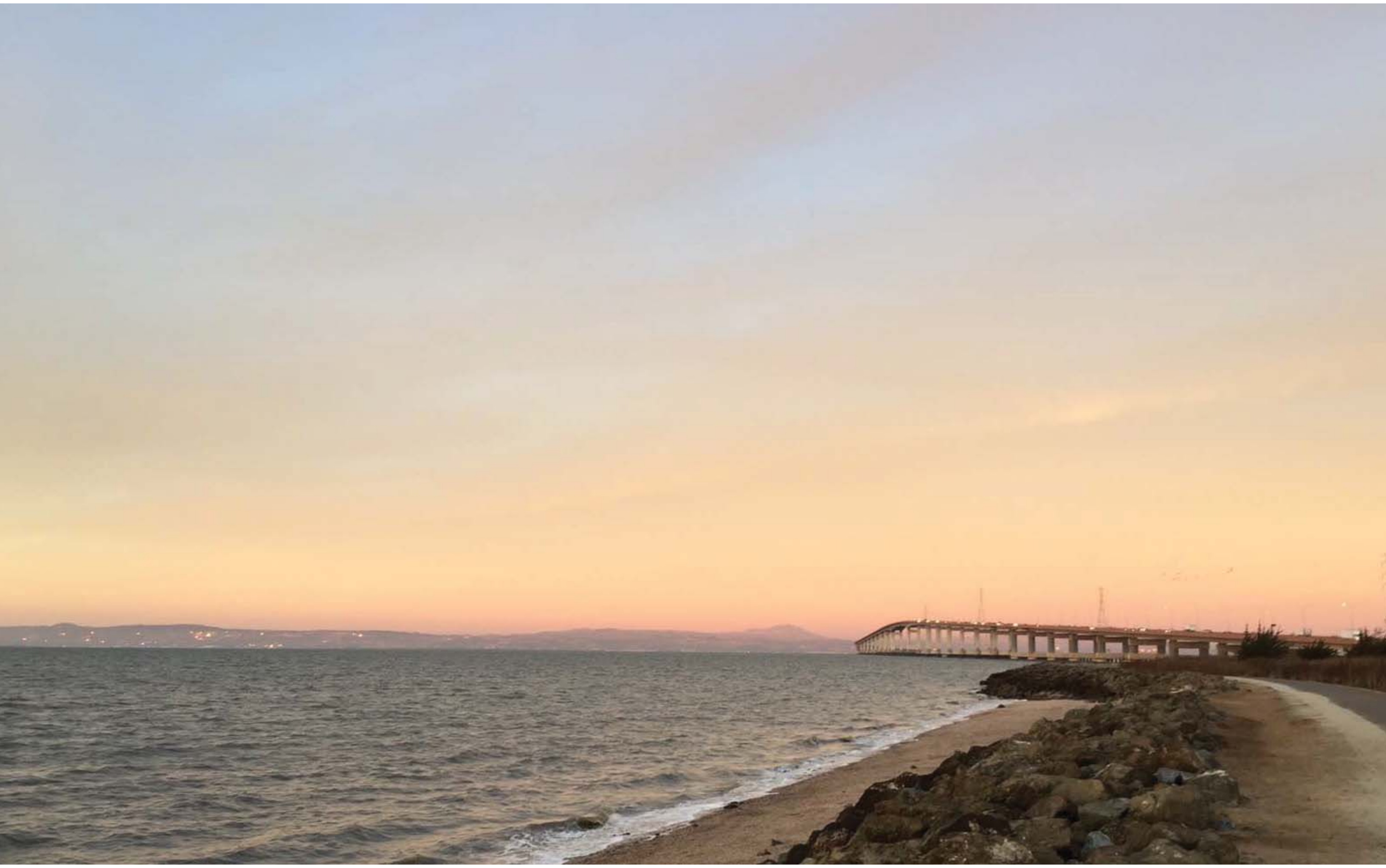
FOSTER CITY LEVEE PROTECTION PLANNING AND IMPROVEMENTS PROJECT

Draft Environmental Impact Report

Capital Improvement Project No. 301-657
State Clearinghouse No. 2016012012



Prepared for:

City of Foster City

November 2016

URBAN PLANNING PARTNERS INC.

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Prepared for the City of Foster City

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Tom Origer & Associates

November 2016

URBAN
PLANNING
PARTNERS
INC.

NOTICE OF AVAILABILITY
CITY OF FOSTER CITY
FOSTER CITY LEVEE PROTECTION PLANNING AND IMPROVEMENTS PROJECT (CIP 301-657)
DRAFT ENVIRONMENTAL IMPACT REPORT AND PUBLIC HEARING – JANUARY 19, 2017

State Clearinghouse # 2016012012

NOTICE IS HEREBY GIVEN that the City of Foster City, as Lead Agency, has completed a Draft Environmental Impact Report (DEIR) for the Foster City Levee Protection Planning and Improvements Project (CIP 301-657).

PUBLIC HEARING: The Planning Commission is scheduled to receive public comments on the DEIR on **January 19, 2017, at 7:00 p.m**. at Foster City Council Chambers, located at 620 Foster City Boulevard.

PUBLIC REVIEW TIMELINE: The public review period for the DEIR begins **November 23, 2016 and ends January 12, 2017**. The City must receive all written comments regarding the adequacy of the DEIR within this time period. Written comments may be submitted in person, by mail, by e-mail, or by fax. The mailing address is 610 Foster City Boulevard, Foster City, California 94404, the email address is cbanks@fostercity.org and the fax number is (650) 286-3589. Direct all comments to the attention of Curtis Banks, Community Development Director.

DOCUMENT AVAILABILITY: Copies of the DEIR are available for review Monday through Friday, between the hours of 8:00 a.m. and 5:00 p.m., at the City of Foster City City Hall, Community Development Department, 610 Foster City Boulevard, Foster City, California, 94404, except on specified holidays. The DEIR is also available at the Foster City Public Library, at 1000 East Hillsdale Boulevard, and online, at http://www.fostercity.org/.

PROJECT LOCATION: The project location will be generally located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system that surrounds Foster City along the bayfront with a slight deviation from the existing levee system footprint, and includes six proposed construction staging areas. Figure 1 depicts the location of the project site.

PROJECT DESCRIPTION: The existing levee system was originally authorized by the US Army Corps of Engineers (Corps) Section 404 Clean Water Act Regulatory Program on February 20, 1976 (Permit No. 9318-49) to protect properties interior of the levee from flooding as a result of levee overtopping either from high tides (stillwater or storm surges) and/or wave runup. Approximately 9,000 properties in Foster City are protected from the one-percent annual chance of flooding by the existing levee system that was primarily designed for flood protection. An additional 8,000 properties in the City of San Mateo are also protected by the Foster City levee system. Conversely, properties in Foster City are protected from the one-percent flood by San Mateo’s levee and floodwall systems south of San Mateo Creek.

The City’s levee system has been subsequently improved over time in order to maintain Federal Emergency Management Agency (FEMA) levee accreditation and was last re-accredited by FEMA in 2007. Updated FEMA flood hazard information was provided to the City in 2014 and codified in the FEMA preliminary Flood Insurance Rate Mapping (FIRM) released on August 13, 2015. Current FEMA guidelines require the current levee elevation along the City’s levee system to be raised to protect the City from flooding associated with levee overtopping from extreme high tides (stillwater or storm surges) and/or wave runup.

The purpose of the project is to provide flood protection in accordance with updated FEMA guidelines and retain FEMA accreditation for its existing levee system. In addition, the improved levee system will be designed to adapt to future sea level rise while maintaining public access along the levee system and protections for sensitive habitat and species. If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San

Mateo will be placed in a high-risk Special Flood Hazard Area by FEMA, due to the risks associated with levee overtopping from high tides (stillwater or storm surges) and/or wave runup.

The precise design and height of the project is not yet finalized; therefore, the environmental analysis studies two scenarios at an equal level, which would have different ranges of levee elevations/floodwall heights as needed to meet FEMA freeboard requirements and protect against future sea level rise. "Freeboard" is additional levee height above the 100-year flood elevation that tends to compensate for the factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodway conditions, such as wave action and the hydrological effect of urbanization of the watershed. The two scenarios are:

1. FEMA Freeboard with Sea Level Rise for the Year 2050
2. FEMA Freeboard with Sea Level Rise for the Year 2100

Based on currently available data, preliminary evaluations, and City Council direction, the City anticipates that the project will utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints. These three levee improvement types are as follows:

1. Sheet Pile floodwall
2. Earthen levee
3. Conventional floodwall

This hybrid approach (combining improvement types 1, 2 and 3) would provide the most flexibility to meet current FEMA standards and retain FEMA accreditation and would also achieve the following: (a) maintain public access and recreational opportunities; (b) minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and State (including wetlands) within San Francisco Bay; (c) minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the levee; and (d) avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal- and State-listed species to the maximum extent feasible.

SIGNIFICANT ANTICIPATED ENVIRONMENTAL EFFECTS: The DEIR provides an evaluation of the potential environmental impacts of the proposed project and recommends mitigation measures to reduce impacts to a less-than-significant level. With the implementation of the proposed mitigation measures, no significant impacts would result with implementation of the proposed project, except for the following impacts:

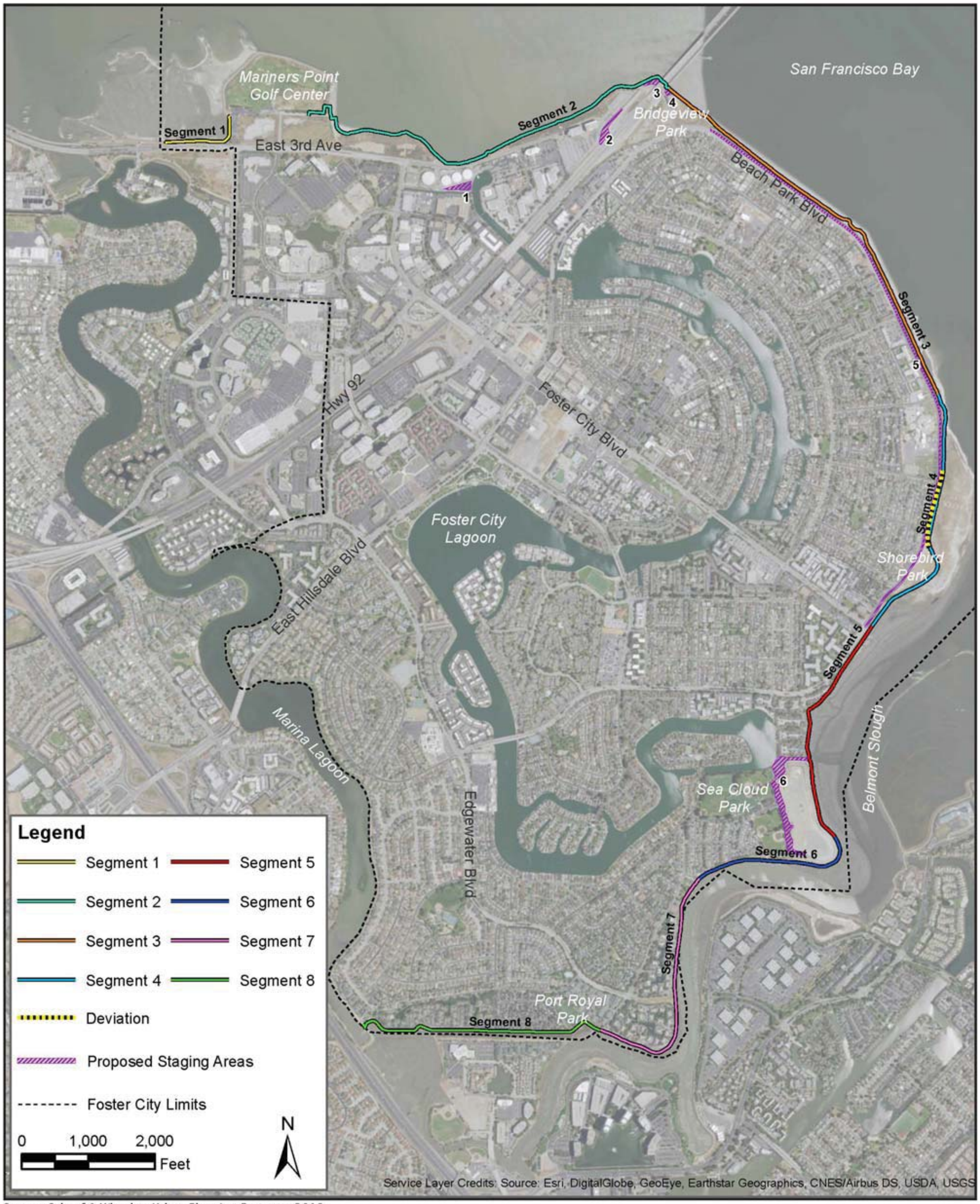
- Aesthetics and Shade and Shadow — The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.

- Noise and Vibration — Construction of the proposed project could result in the exposure of nearby sensitive receptors, such as residences, schools, hospitals, and retirement homes, to temporary noise levels that would conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving).

These impacts would remain significant and unavoidable, since the mitigation measures identified in the DEIR would not reduce these impacts to a less-than-significant level. The project site is not listed on any of the lists of hazardous materials sites enumerated under Section 65962.5 of the Government Code.

QUESTIONS: If you have any questions about this project, please contact Curtis Banks, Community Development Director at (650) 286-3239 or cbanks@fostercity.org.

Figure 1: Project Site for Levee Protection Planning and Improvements Project (CIP 301-657)



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

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I. INTRODUCTION

A. PURPOSE OF THE EIR

In compliance with the California Environmental Quality Act (CEQA) and CEQA Guidelines, this Draft Environmental Impact Report (EIR) describes the environmental consequences of the proposed Foster City Levee Protection Planning and Improvements Project (CIP 301-657) (hereafter referred to as "the project") to be carried out by the City of Foster City (the City). CEQA provides the following definition for a project:

> "'Project' means an activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and which is any of the following:
>
> (a) An activity directly undertaken by any public agency.
>
> (b) An activity undertaken by a person which is supported, in whole or in part through contracts, grants, subsidies, loans, or other forms of assistance from one or more public agencies.
>
> (c) An activity that involves the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies."

After meeting these criteria, it must be determined whether or not the project will have a significant impact on the environment. If the project is deemed to have a potential impact on the environment, an EIR must be prepared (see e.g., CEQA Guidelines Section15378).[1]

The intent of this EIR is to: (1) inform stakeholders – City staff, the Planning Commission, the City Council, and other responsible and interested agencies, as well as the public – of the proposed project and its potential adverse environmental impacts; (2) recommend mitigation measures to lessen or avoid significant adverse impacts; and (3) consider a reasonable range of feasible alternatives. The information contained in the EIR will be reviewed and considered by public agencies before project-related decisions are made.

The City of Foster City is the lead agency for environmental review of the proposed project. The Draft EIR is available for public review for the period identified in the Notice of Availability attached to the front of this document. During this time, written comments on the Draft EIR may be submitted to the City of Foster City, Community Development Department at the address indicated on the Notice of Availability. Responses to all

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[1] CEQA Guidelines are codified at Title 14 of the California Code of Regulations at Section 15000 et seq.)

comments received on the Draft EIR during the specified review period will be included in the Response to Comments Document/Final EIR.

B. PROPOSED PROJECT

The project site will be generally located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system that surrounds Foster City along the bayfront with a slight deviation from the existing levee system footprint, and includes six proposed construction staging areas. The regional context is shown in Figure I-1, and the project vicinity is shown in Figure I-2. The existing levee begins at the San Mateo city limit in the north (adjacent to East 3rd Avenue), extends parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and ends adjacent to U.S. Highway 101 in the south at the San Mateo/Belmont city limits.

Approximately 9,000 properties in Foster City are protected from the 100-year flood by the levee system that was primarily designed for flood protection. An additional 8,000 properties in the city of San Mateo are also protected by the Foster City levee system. Similarly, properties in Foster City are protected from the 100-year flood[2] by San Mateo's levee and floodwall systems south of San Mateo Creek. The current levee system in Foster City was recertified and accredited by the Federal Emergency Management Agency (FEMA) in 2007 designating land within Foster City as Zone X (low-risk area).

In July 2014, FEMA completed the Central San Francisco Bay Coastal Flood Hazard Study as part of the California Coastal Analysis and Mapping Program (CCAMP). Results of the study will be used by FEMA to remap the Flood Insurance Rate Maps (FIRMs) for San Francisco Bay communities, which includes Foster City. Based on the study, roughly 85 percent of Foster City's levee system does not meet the required freeboard elevation per Title 44 of the Code of Federal Regulations (CFR), Section 65.10[3]; therefore, the levee will not retain accreditation status when the FIRM is updated in mid-2017. The current levee elevation ranges from 11–13 feet above the North American Vertical Datum of 1988 (NAVD 88).[4,5]

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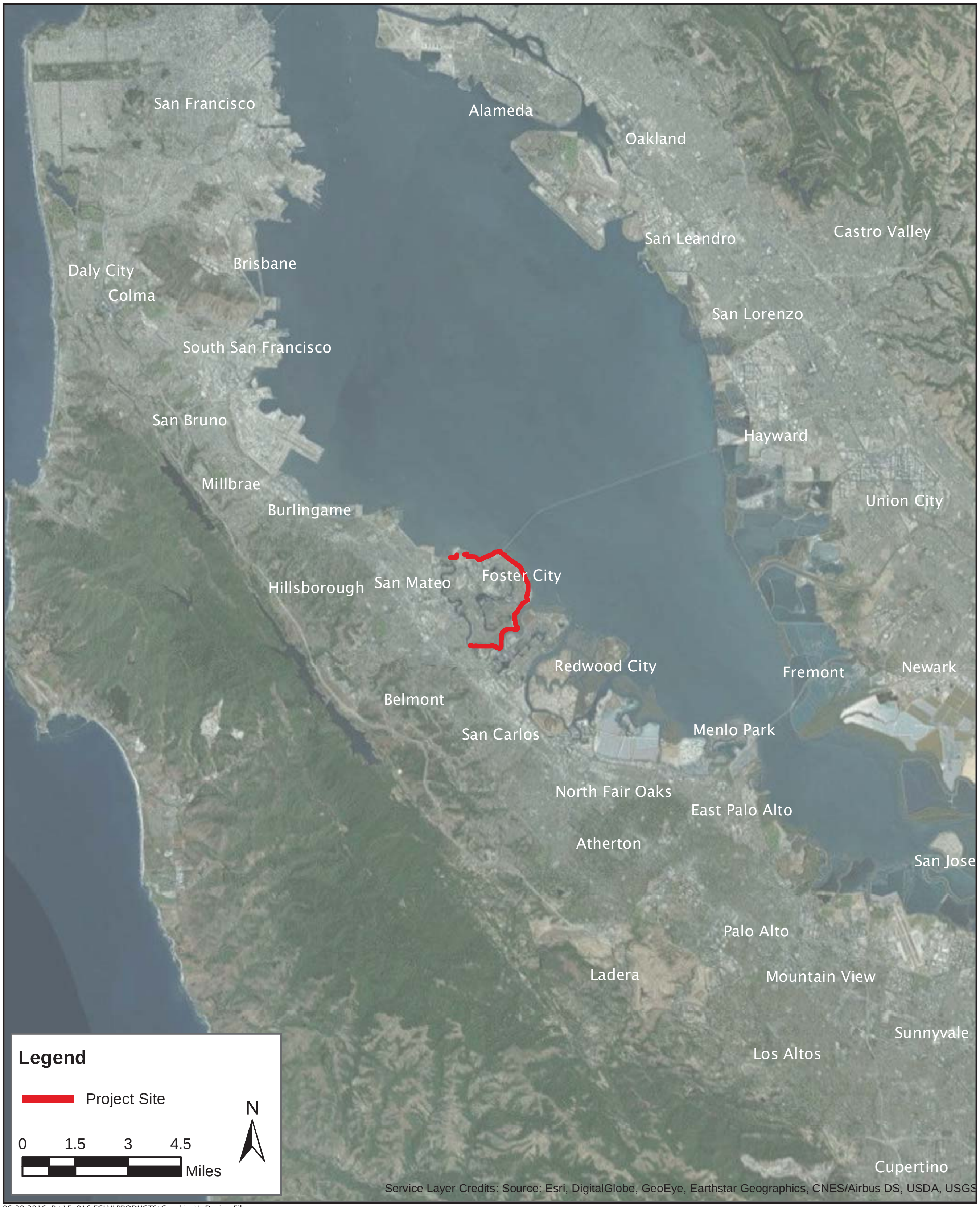
[2] The term "100-year flood" is a flood that statistically has a 1 percent chance of occurring any given year.

[3] 44 CFR Section 65.10 provides the minimum design, operation, and maintenance standards levee systems must meet and continue to meet in order to be recognized as providing protection from the base flood on a Flood Insurance Rate Map.

[4] Schaaf & Wheeler. 2015. Foster City Levee Protection Planning Study. February.

[5] A vertical datum is a surface of zero elevation to which heights of various points are referred in order that those heights be in a consistent system. The NAVD 88 consists of a leveling network on the North American Continent, ranging from Alaska, through Canada, across the United States, affixed to a single origin point on the continent. In 1993, the NAVD 88 was affirmed as the official vertical datum in the National Spatial Reference System for the Conterminous United States and Alaska. FEMA's official mapping products use this datum. The NAVD 88 represents height above Low Mean Sea Level (LMSL) as 6.271meters.



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Source: Schaaf & Wheeler, Urban Planning Partners, 2016
Note: The location of staging areas are preliminary and may change.

Figure I-1
Foster City Levee Protection Planning and Improvements Project EIR
Regional Context Map

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure I-2
Foster City Levee Protection Planning and Improvements Project EIR
Project Vicinity Map

The freeboard[6] elevation required is between 12.5–16 feet NAVD 88. The proposed project would provide flood protection in accordance with updated FEMA guidelines and retain FEMA levee accreditation for the City's existing levee system. For FEMA to recognize the flood protection benefits of a levee, the levee must have adequate freeboard and must be certified by a registered professional engineer, showing that the levee system is expected to provide 100-year flood risk reduction.[7,8]

If FEMA accreditation is not retained, approximately 17,000 individual properties within Foster City and San Mateo will be located in a FEMA-designated Special Flood Hazard Area,[9] due to the risks associated with levee overtopping from high tide or storm surges. This designation would require homeowners with federally insured mortgages to obtain flood insurance. It would also make new building code requirements applicable to both home remodels and rebuilds. The precise design and height of the levee is not yet finalized. Therefore, the environmental analysis will study two scenarios at an equal level of detail, which would have different ranges of levee elevations and floodwall heights as needed to meet FEMA freeboard requirements and protect against future sea level rise.[10] Note the levee elevation is measured from NAVD 88 whereas the floodwall height is measured from the top of the levee/Bay Trail. The two scenarios are:

1. FEMA Freeboard with sea level rise for the year 2050 (hereafter referred to as "2050 Sea Level Rise").
2. FEMA Freeboard with sea level rise for the year 2100 (hereafter referred to as "2100 Sea Level Rise").

According to the City and County of San Francisco, the current recommended sea level rise planning scenarios for Foster City in the year 2050 and 2100 are 1.25 and 3.83 feet, respectively.[11] Including this additional height beyond the FEMA freeboard requirement in both scenarios provides a means for the City to adapt to future sea level rise due to climate change and would prolong the life of the project. Based on currently available data, preliminary evaluations, and City Council direction, the City anticipates that the

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[6] Freeboard is a factor of safety usually expressed in feet above a flood level for purposes of floodplain management. "Freeboard" tends to compensate for the many unknown factors that could contribute to flood heights greater than the height calculated for a selected size flood and floodwater conditions, such as wave action, bridge openings, and the hydrological effect of urbanization of the watershed.

[7] United States, 2002. Code of Federal Regulations (CFR): Emergency Management and Assistance. Section 65.10.

[8] Federal Emergency Management Agency (FEMA), 2016. Freeboard. http://www.fema.gov/freeboard, accessed August 17.

[9] Defined as the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year. The 1-percent annual chance flood is also referred to as the base flood or 100-year flood.

[10] Federal Emergency Management Agency (FEMA), 2016, op.cit.

[11] City and County of San Francisco, 2014. *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco*. September 22.

project will utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints. These three levee improvement types are as follows:

1. Sheet pile floodwall
2. Earthen levee
3. Conventional floodwall

A combination of types 1, 2, and 3 depending upon location would provide the most flexibility to meet current FEMA standards and retain FEMA accreditation while maintaining public access along the levee system and protection for sensitive habitats and species.

C. NOTICE OF PREPARATION/EIR SCOPE

The City circulated a Notice of Preparation (NOP) that briefly described the proposed project and the environmental topics that would be evaluated in the EIR. The NOP was published and submitted to the State Clearinghouse on January 5, 2016. The 30-day public comment period for the scope of the EIR lasted from January 5, 2016 to February 4, 2016. A revised NOP was issued on August 12, 2016 in light of modifications to the project scope which included a slight deviation from the original project footprint and the addition of a third improvement type (conventional flood wall). The revised NOP was circulated for a 30-day public comment period through September 12, 2016. The public was advised of the NOP and the public scoping session in the following ways: published in notices in the Foster City Islander and San Mateo Daily Journal; posted on the City of Foster City website; televised on Foster City TV Channel 27; posted on site and at all of the City's official posting locations; and emailed to the Planning Listserv and Levee Improvement Project Listserv. It was also distributed to affected State of California agencies and the State Clearinghouse.

One public scoping session was held for the project in conjunction with the Planning Commission meeting on February 4, 2016. Comments received by the City on the NOP at the public scoping meeting were taken into account during preparation of the EIR. At the public scoping meeting, three members of the public provided verbal comments in support of the City analyzing a horizontal levee improvement type and the use of softscape design rather than hardscape structure (i.e., walls). Speakers included Mark Holmes with The Bay Institute, Jeremy Lowe with the San Francisco Estuary Institute, and JC Miller, with Vallier Design Associates, Inc. NOP comment letters were received from the California Department of Transportation (Caltrans), the California State Lands Commission (CSLC), the San Francisco Bay Conservation and Development Commission (BCDC), and Pacific Gas and Electric Company (PG&E). Comment letters on the revised NOP were received from the State Clearinghouse and Planning Unit, PG&E, FEMA, BCDC, the Amah Mutsun Tribal Band, and a Foster City resident.

Comments from Caltrans encouraged the City to coordinate with the department during preparation of the Traffic Impact Study for the analysis of travel demand expected from the proposed project. This letter also detailed application requirements for: (1) a transportation permit, if oversized or excessive load vehicles are anticipated on state roadways; (2) a Transportation Management Plan, if traffic restrictions and detours are needed on or affecting the state highway system; and (3) an encroachment permit for any work that encroaches onto the state right-of-way.

Comments from the CSLC emphasized the agency's jurisdictional authority for projects that could directly or indirectly affect sovereign lands. The letter provided an overview of CSLC's jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. CSLC also provided general comments on information to be included in the Project Description chapter and the Aesthetics, Biological Resources, and Cultural Resources sections, as well as in the alternatives and effects of sea level rise discussions in all resource categories.

The comment letter from BCDC noted that the project is in the commission's jurisdictional limit and would require a permit, and, if approved, must demonstrate consistency with the San Francisco Bay Plan (Bay Plan). The letter then provided an overview of applicable Bay Plan findings, including policy requirements related to: (1) recreation policies and waterfront priority use areas; (2) fish and other aquatic organisms and wildlife; (3) water quality and subtidal areas; (4) public access and appearance, design, and scenic views; and (5) climate change, shoreline protection, and safety of fills.

PG&E commented that the company's facilities may be affected as part of the proposed project and requested that the EIR include a project description of any modified facilities and associated environmental impacts as a result of the project.

There were also comments received during the public scoping session. Mark Holmes with The Bay Institute suggested evaluating the impact of hardscapes that may be of concern to regulatory agencies and consider a softscape alternative. Jeremy Lowe with the San Francisco Estuary Institute highlighted the potential impacts of hard levees and suggested investigating hybrid levees that incorporate softscape elements such as marshes, beaches, and mudflats. Lastly, JC Miller, with Vallier Design Associates, Inc. suggested that a horizontal levee be studied sincerely in the EIR.

In response to the revised NOP, the State Clearinghouse and Planning Unit provided a confirmation of receipt of the revised NOP.

In response to the revised NOP, PG&E provided comments over their concerns regarding their utility facilities and addressed the assignment of a liaison to the City to provide input for the project.

FEMA submitted a comment letter in response to the revised NOP. The letter outlines the National Flood Insurance Program (NFIP) floodplain management building requirements.

In response to the revised NOP, BCDC stated that: (1) the project would fall within their jurisdiction and a permit from them would be required; (2) the FEMA Freeboard alternative would likely not meet their certification standards; and (3) a sheet pile floodwall could lead to erosion and greater impacts to adjacent wetland areas and suggested studying a horizontal levee.

In response to the revised NOP, the Amah Mutsun Tribal Band commented that they would wait for the State Clearinghouse report before providing assistance on the project.

Additionally, a Foster City resident provided a comment letter, via e-mail, inquiring whether the proposed project would address earthquake loads in addition to tidal and wave loads.

In addition, comment letters were received from the Law Offices of Mark C. Watson, P.C. representing Sam Runco, a property owner who owns an undeveloped property located in Foster City along the eastern stretch of the existing levee system, for approximately 4,000 feet along Beach Park Boulevard from Gull Avenue to Swordfish Street (hereinafter referred to as the "Runco Property"). Two letters were received, one on October 16, 2015 and the other on February 18, 2016, both of which fall outside of both NOP comment periods. The Runco Property lies on the east side of Beach Park Boulevard at Swordfish Street, just beyond the protected area of the existing levee and proposed project. The letters claim that the project would: protect others at the expense of Mr. Runco; damage the Runco Property; decrease the value of the Runco Property; force Mr. Runco to pay taxes for the improvements without receiving any corresponding benefit. The letter also claimed building the levee as proposed could constitute a taking of the Runco property. The letters also advocate for the preference of a "hybrid levee" that would also include the Runco Property in its flood protection. In these letters, a "hybrid levee" is defined as a horizontal levee in combination with a smaller traditional levee.

The original and revised NOPs are included in Appendix A of this document, as are written comments received by the City on both NOPs.

The following environmental topics are addressed in this EIR:

A. Aesthetics and Shade and Shadow
B. Air Quality

C. Biological Resources
D. Cultural Resources
E. Soils, Geology, and Seismicity
F. Greenhouse Gas Emissions
G. Hazards and Hazardous Materials
H. Hydrology and Water Quality
I. Land Use
J. Noise and Vibration
K. Traffic and Transportation
L. Recreation

Environmental topics not warranting detailed evaluation (agriculture and forest resources, mineral resources, population and housing, public services, and utilities and service systems) are discussed in *Chapter VII, CEQA Required Assessment Conclusions,* subsection D, Effects Found Not to be Significant.

Chapter IV, Planning Policy, discusses the proposed project's relationship with applicable planning-related policies. This discussion is provided in a standalone chapter of this EIR, because a policy conflict is not in and of itself considered a significant environmental impact under CEQA. To the extent the project conflicts with policies adopted for the purpose of avoiding or mitigating significant environmental impacts, those conflicts are identified and addressed in the relevant resource category and associated chapter.

D. REPORT ORGANIZATION

This EIR is organized into the following chapters:

- *Chapter I – Introduction*: Discusses the overall EIR purpose; summarizes the proposed project; describes the EIR scope; and outlines the organization of the EIR.
- *Chapter II – Summary:* Summarizes the impacts that would result from implementation of the proposed project; describes mitigation measures recommended to avoid or reduce significant impacts; identifies areas of known controversy; and describes the project alternatives.
- *Chapter III – Project Description:* Describes the project objectives, project site, site development history, proposed development, and required approval process.
- *Chapter IV – Planning Policy:* Lists relevant planning policies and describes the project's relationship to each policy.
- *Chapter V – Setting, Impacts, and Mitigation Measures:* Describes the following for each environmental topic: existing conditions (setting), significance criteria, potential environmental impacts and their level of significance, and mitigation measures

recommended to mitigate identified significant impacts. Cumulative impacts are also discussed in each technical topic section. Potential adverse impacts are identified by levels of significance, as follows: less-than-significant impact (LTS), significant impact (S), and significant and unavoidable impact (SU). The significance level is identified for each impact before and after implementation of the recommended mitigation measure(s).

- *Chapter VI – Alternatives:* Evaluates four alternatives to the proposed project. The alternatives include the No Project/No Build Alternative, the Existing Levee Footprint 2050 Alternative, the Horizontal Levee 2050 Alternative, and the FEMA Freeboard Alternative.
- *Chapter VII – CEQA Required Assessment Conclusions:* Provides the required analysis of effects found not to be significant; growth-inducing impacts; unavoidable significant effects; and significant irreversible changes.
- *Chapter VIII – Report Preparation*: Identifies preparers of the EIR, references used, and persons and organizations contacted.
- *Appendices:* Includes the original and revised NOP and written comments submitted on both NOPs; Biological Assessment, Cultural Resources Reports, and Air Quality and Greenhouse Gas Emissions modeling data, Noise Measurements Data Report, and Traffic Impact Study.

All supporting technical documents and reference documents are available for public review at the City of Foster City Community Development Department.

II. SUMMARY

A. OVERVIEW OF PROPOSED PROJECT

This Environmental Impact Report (EIR) has been prepared to evaluate the potential environmental effects of the proposed Foster City Levee Protection Planning and Improvements Project to be carried out by the City of Foster City (the project) in accordance with the California Environmental Quality Act (CEQA). The project site will be generally located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system that surrounds Foster City along the bayfront with a slight deviation from the existing levee system footprint, and includes six proposed construction staging areas.

The San Francisco Bay side of the Foster City levee system consists of fully tidal open water, slough channels, wetlands, and mud flats. Land uses on the landward side of the levee system consist of streets, residential and commercial areas, managed lagoon, landscaped open space and recreational areas including the Bay Trail, unimproved lots, muted tidal wetlands, and seasonal wetlands.

The purpose of the project is to retain Federal Emergency Management Agency (FEMA) accreditation for the levee system. In addition, the City's levee improvement design, once implemented to achieve the project purpose, would also provide some level of sea level rise protection (as well as flexibility to adapt to increased levels of protection in the future) while maintaining public access along the levee system and protection for sensitive species and habitat.

The environmental analysis will study two scenarios: FEMA Freeboard with sea level rise for the year 2050 and FEMA Freeboard with sea level rise for the year 2100. According to the City and County of San Francisco, the current recommended sea level rise planning scenarios for Foster City in the year 2050 and 2100 are 1.25 and 3.83 feet, respectively.[1] Including this additional height beyond the FEMA freeboard requirement in both scenarios provides a means for the City to adapt to future sea level rise due to climate change and would prolong the life of the project. Additionally, the City anticipates utilizing a combination of three levee improvement types: sheet pile floodwall, earthen levee, and conventional floodwall that are described further in *Chapter III, Project Description*.

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[1] City and County of San Francisco, 2014. *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco*. September 22.

B. SUMMARY OF IMPACTS AND MITIGATION MEASURES

This summary provides an overview of the analysis contained in *Chapters V* through *VII* of this EIR. CEQA requires a summary discussion of the following: (1) potential areas of controversy; (2) significant impacts and proposed mitigation measures; (3) cumulative impacts; (4) significant irreversible and unavoidable impacts; and (5) alternatives to the proposed project. Each of these topics is summarized below.

1. Potential Areas of Controversy

No areas of substantial controversy regarding the project were raised in letters or verbal comments received in response to the original Notice of Preparation (NOP) dated January 5, 2016 nor the revised NOP dated August 12, 2016. A total of six NOP comment letters were received, as follows:

- Two letters from State of California agencies: (1) California Department of Transportation (Caltrans); and (2) California State Lands Commission (CSLC)
- Two letters from the regional agency: San Francisco Bay Conservation and Development Commission (BCDC)
- Two letters from the regional utility company: Pacific Gas and Electric Company (PG&E)
- Two letters from the State Clearinghouse and Planning Unit
- One letter from FEMA
- One letter from the Amah Mutsun Tribal Band
- One email from a Foster City resident

Comments from Caltrans encouraged the City to coordinate with the department during preparation of the Traffic Impact Study for the analysis of travel demand expected from the proposed project. This letter also detailed application requirements for: (1) a transportation permit, if oversized or excessive load vehicles are anticipated on state roadways; (2) a Transportation Management Plan, if traffic restrictions and detours are needed on or affecting the state highway system; and (3) an encroachment permit for any work that encroaches onto the state right-of-way.

Comments from the CSLC emphasized the agency's jurisdictional authority for projects that could directly or indirectly affect sovereign lands. The letter provided an overview of CSLC's jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. CSLC also provided general comments on information to be included in the Project Description chapter and the Aesthetics, Biological Resources, and Cultural Resources sections, as well as in the effects of sea level rise discussions in all resource categories.

The comment letter from BCDC noted that the project is in the commission's jurisdictional limit and would require a permit, and, if approved, must demonstrate consistency with the San Francisco Bay Plan (Bay Plan). The letter then provided an overview of applicable Bay Plan findings, including policy requirements related to: (1) recreation policies and waterfront priority use areas; (2) fish and other aquatic organisms and wildlife; (3) water quality and subtidal areas; (4) public access and appearance, design, and scenic views; and (5) climate change, shoreline protection, and safety of fills.

PG&E commented that the company's facilities may be affected as part of the proposed project and requested that the EIR include a project description of any modified facilities and associated environmental impacts as a result of the project.

There were also comments received during the public scoping session. Mark Holmes with The Bay Institute suggested evaluating the impact of hardscapes that may be of concern to regulatory agencies and consider a softscape alternative. Jeremy Lowe with the San Francisco Estuary Institute highlighted the potential impacts of hard levees and suggested investigating hybrid levees that incorporate softscape elements such as marshes, beaches, and mudflats. Lastly, JC Miller, with Vallier Design Associates, Inc. suggested that a horizontal levee be studied sincerely in the EIR.

In response to the revised NOP, the State Clearinghouse and Planning Unit provided a confirmation of receipt of the revised NOP.

In response to the revised NOP, PG&E provided comments over their concerns regarding their utility facilities and addressed the assignment of a liaison to the City to provide input for the project.

FEMA submitted a comment letter in response to the revised NOP. The letter outlines the National Flood Insurance Program (NFIP) floodplain management building requirements.

In response to the revised NOP, BCDC stated that: (1) the project would fall within their jurisdiction and a permit from them would be required; (2) the FEMA Freeboard alternative would likely not meet their certification standards; and (3) a sheet pile floodwall could lead to erosion and greater impacts to adjacent wetland areas and suggested studying a horizontal levee.

In response to the revised NOP, The Amah Mutsun Tribal Band comments stated that they would wait for the State Clearinghouse report before providing assistance on the project.

Additionally, a Foster City resident provided a comment letter, via e-mail, inquiring whether the proposed project would address earthquake loads in addition to tidal and wave loads.

In addition, comment letters were received from the Law Offices of Mark C. Watson, P.C. representing Sam Runco, property owner of an undeveloped property located in Foster City along the eastern stretch of the existing levee system, for approximately 4,000 feet along Beach Park Boulevard from Gull Avenue to Swordfish Street (hereinafter referred to as the "Runco Property"). A total of two letters were received, one on October 16, 2015 and the other on February 18, 2016, both of which fall outside of both NOP commenting periods. The Runco Property lies on the east side of Beach Park Boulevard at Swordfish Street, just beyond the protected area of the existing levee and proposed project. The letters claim that the project would: protect others at the expense of Mr. Runco; damage the Runco Property; decrease the value of the Runco Property; constitute a taking of the Runco Property; and force Mr. Runco to pay taxes for the improvements without receiving any corresponding benefit. The letters also advocate for the preference of a "hybrid levee" that would also include the Runco Property in its flood protection. In these letters, a "hybrid levee" is defined as a horizontal levee in combination with a smaller traditional levee.

These issues were taken into consideration in the scope of this project and are addressed in *Chapter V, Setting, Impacts, and Mitigation Measures.*

2. Significant and Significant Unavoidable Impacts

Under CEQA, a significant impact on the environment is defined as "…a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance."[2]

As discussed in *Chapter V, Setting, Impacts, and Mitigation Measures*, and shown in Table II-1 below, the project would result in several potentially significant impacts. The majority of the impacts identified would be mitigated to a less-than-significant level with implementation of the recommended mitigation measures. However, impacts may be significant and unavoidable for the following resource topics (also see impacts identified as SU in Table II-1):

- Aesthetics and Shade and Shadow — The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.
- Noise and Vibration — Construction of the proposed project could result in the exposure of nearby sensitive receptors, such as residences, schools, hospitals, and

[2] CEQA Guidelines Section 15382.; see also Public Resources Code Section 21068.

retirement homes, to temporary noise levels that would conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving).

The potentially significant impacts that could be mitigated to a less-than-significant level with implementation of recommended mitigation measures are identified for the following topics and are evaluated in full detail in *Chapter V, Setting, Impacts, and Mitigation Measures*, of this EIR:

- Aesthetics and Shade and Shadow
- Air Quality
- Biological Resources
- Cultural Resources
- Soils, Geology, and Seismicity
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Noise
- Traffic and Transportation
- Recreation

Impacts are anticipated to be less than significant for all other environmental topics.

Cumulative impacts are discussed at the end of each topic section in *Chapter V, Setting, Impacts, and Mitigation Measures*. The proposed project would significantly contribute to only one significant cumulative impact (relating to fugitive dust from project construction), however this impact could be mitigated to a less-than-significant level with mitigation.

3. Alternatives to the Proposed Project

Chapter VI, Alternatives, analyzes four alternatives to the proposed project to meet the CEQA requirements for analysis of a reasonable range of project alternatives. The four additional project alternatives analyzed in *Chapter VI* are as follows:

- **No Project/No Build Alternative** — assumes the project would not be developed. The existing levee would remain in its current condition.
- The **Existing Levee Footprint 2050 Sea Level Rise Alternative** — assumes the project would improve the approximately 43,000-linear-foot (8 miles) existing levee system with no deviation from the existing levee system alignment. This alternative assumes the same levee improvement types as described under the proposed project's 2050 Sea Level Rise project scenario. Unlike both project scenarios, there would be no deviation within segment 4 from the existing levee system alignment.

- **Horizontal Levee 2050 Sea Level Rise Alternative** — assumes portions of the levee system (segment 2) would be replaced with earthen fill in what is known as an "ecotone slope" or "horizontal levee" that blend a traditional earthen levee with restored tidal marshes. This alternative assumes the same levee improvement types for segment 1 and segments 3 through 8 as described under the proposed project's 2050 Sea Level Rise project scenario.
- **FEMA Freeboard Alternative** — assumes the project site would be located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system with the same slight deviation within segment 4 as both proposed project scenarios. This alternative would have the same levee improvement types and locations as the proposed project's 2050 Sea Level Rise project scenario but the top elevation for the levee/floodwall would be lower as it would only meet the elevations necessary to retain FEMA accreditation and not address sea level rise. The current levee ranges from 11–13 feet NAVD 88 and it would range from 12.5–16.5 feet NAVD 88 under this alternative (under the 2050 Sea Level Rise project scenario it would range from 13.5–19 feet NAVD 88). This alternative would only require 7,000–8,000 cubic yards of fill to raise the elevation of the levee. This alternative will satisfy FEMA's requirement for accredited levees but not achieve protection from anticipated sea level rise.

C. SUMMARY TABLE

Information in Table II-1, Summary of Impacts and Mitigation Measures, has been organized to correspond with environmental issues discussed in *Chapter V*. The table is arranged in four columns: (1) impacts; (2) level of significance prior to mitigation; (3) recommended mitigation measure; and (4) level of significance after mitigation. A series of mitigation measures is noted where more than one mitigation measure is required to achieve a less-than-significant impact, and alternative mitigation measures are identified when available. For a complete description of potential impacts and recommended mitigation measures, please refer to the specific discussions in *Chapter V.*

The following abbreviations are used for individual topics:

AES: Aesthetics and Shade and Shadow
AIR: Air Quality
BIO: Biological Resources
CULT: Cultural Resources
GEO: Soils, Geology, and Seismicity
GHG: Greenhouse Gas Emission
HAZ: Hazards and Hazardous Materials
HYD: Hydrology and Water Quality
LAND: Land Use
NOI: Noise and Vibration

TRANS: Traffic and Transportation
REC: Recreation

The following notations are provided after each identified significant impact and mitigation measure:

SU = Significant and Unavoidable
S = Significant
LTS = Less than Significant

These notations indicate the significance of the impact with and without mitigation.

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
A. AESTHETICS AND SHADE AND SHADOW			
AES-1: The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.	S	AES-1: During the landscaping/wall enhancement, the floodwall adjacent to Shorebird Park (segment 4) and adjacent to Sea Cloud Park (segment 6) shall be treated with landscaping and/or variations of wall materials. The City of Foster City Public Works Department and/or the project team shall select drought-tolerant plantings compatible with the Foster City Climate Zone vegetation for this landscaping work suitable for the project site and consistent with the aesthetic characteristic of the surrounding area and reflective of existing plantings in the surrounding area.	SU
B. AIR QUALITY			
AIR-1: Fugitive dust emissions generated during project construction may result in significant air quality impacts.	S	AIR-1: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement dust control requirements. The following controls shall be implemented at all construction sites and staging areas within the project to control dust production and fugitive dust. a. Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing sensitive land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers to control dust; b. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard; c. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites; d. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; e. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets; f. Blowing dust shall be reduced by timing construction activities so that paving and building construction begin as soon as possible after completion of grading, and by landscaping disturbed soils	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		as soon as possible; g. Water trucks shall be present and in use at the construction site; h. All portions of the site subject to blowing dust shall be watered as often as deemed necessary by the City in order to insure proper control of blowing dust for the duration of the project; i. Watering on public streets shall not occur; j. All vehicle speeds on unpaved roads shall be limited to 15 mph; k. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used; l. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations (CCR). Clear signage shall be provided for construction workers at all access points; m. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator; n. Streets will be cleaned by street sweepers or by hand as often as deemed necessary by the City Engineer; o. Watering associated with on-site construction activity shall take place between the hours of 8 a.m. and 7 p.m. and shall include at least one late-afternoon watering to minimize the effects of blowing dust; p. All public streets and medians soiled or littered due to this construction activity shall be cleaned and swept on a daily basis during the workweek to the satisfaction of the City; and q. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
AIR-2: Exhaust emissions generated during project construction may result in significant air quality impacts.	S	AIR-2: The City of Foster City Public Works Department and/or the project team shall require the project contractor to comply with the following exhaust control requirements: a. If the project schedule is not reduced below current estimates, then the project contractor shall ensure that all off-road construction equipment with a 25 horsepower or greater diesel engine meets the U.S. EPA's Tier 3 or higher emission standards. b. If the project schedule is reduced below current estimates, then the project contractor shall ensure that all off-road construction equipment with a 25 horsepower or greater diesel engine meets the U.S. EPA's Tier 4 emission standards. c. The contractor shall submit to the City of Foster City Public Works Department and/or the project team a list of off-road construction equipment to be used on the project with the following information: equipment type and manufacturer; equipment identification number (required by CARB); year of engine manufacture; and engine Tier rating. d. The contractor shall also submit to the City of Foster City Public Works Department and/or the project team a Certification Statement that the contractor agrees to comply fully with the applicable Tier 3 or higher emission standards, as described above, for all off-road diesel equipment and acknowledges that a significant violation of this measure will constitute a material breach of contract.	LTS
AIR-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard.	S	AIR-3: Implement Mitigation Measure AIR-1and AIR-2.	LTS
C. BIOLOGICAL RESOURCES			
BIO-1: The Levee project could result in significant impacts to special-status animal species, including the Ridgway's rail, salt	S	BIO-1a: In order to minimize potential effects to salt marsh harvest mouse, Ridgway's rail, and California black rail and their habitats, the City of Foster City Public Works Department and/or project	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
marsh harvest mouse, and California black rail.		team shall implement the following: a. To the extent feasible, levee construction in segment 4 (south of Shorebird Park), 5, 6, 7, and 8 shall be conducted between September 1 and January 31 to avoid the nesting season of the Ridgway's rail. If construction work is proposed after January 31 or prior to September 1, protocol surveys for Ridgway's rail shall be conducted to determine the extent and location of nesting Ridgway's rail. Results of protocol breeding surveys shall be submitted to the U.S. Fish and Wildlife Service (USFWS) for a determination of whether work proposed within 700 feet of a Ridgway's rail nest (or the activity center of vocalizing Ridgway's rails) discovered during such surveys should be rescheduled to occur during the period from September 1 to January 31. Protocol surveys conducted between January 31 and September 1 shall include nesting surveys for California black rail. Results of surveys for California black rail shall be submitted to California Department of Fish and Wildlife (CDFW) to determine if setbacks are warranted to protect nesting California black rail. b. A qualified biological monitor(s) shall be present during all construction work taking place adjacent to salt marsh providing suitable habitat for Ridgway's rail, California black rail, and salt marsh harvest mouse in segments 4 (south end) 5, 6, 7 and 8. A biological monitor(s) shall also be present during construction work taking place adjacent to suitable foraging habitat for rails in the marsh adjacent to segment 1 and the marsh landward of levee segment 2 that provides potentially suitable winter foraging habitat for California black rail. The monitor(s) are to have demonstrated experience in monitoring sensitive resource issues on construction projects and knowledge of the biology of salt marsh harvest mouse, Ridgway's rail, and California black rail. Prior to the initiation of construction, qualifications of the prospective biological monitor(s) shall be submitted to the USFWS for review and approval. The monitor(s) will have the authority to halt	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		construction, if necessary, when noncompliance actions occur. The biological monitor(s) shall be the contact person for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured, or entrapped listed species. c. Exclusion fencing shall be placed around the bayside of the defined work area prior to the start of construction activities to prevent salt marsh harvest mice from moving into affected areas. The fence shall be made of a material that does not allow harvest mice to pass through, and the bottom shall be buried so that mice cannot crawl under the fence. All supports for the exclusion fencing shall be placed on the landward side of the fence. d. Prior to commencement of construction activity each day in segments 1, 4 (south end), 5, 6, 7, and 8, and near marsh habitats landward of segment 2, the biological monitor(s) shall conduct a preconstruction survey of the anticipated construction zone for that day to ensure that salt marsh harvest mice, Ridgway's rail or California black rail not present within the work area. e. The biological monitor(s) shall provide an endangered species training program to all personnel involved in project construction. At a minimum, the employee education program must consist of a brief presentation by persons knowledgeable about Ridgway's rail, California black rail, and salt marsh harvest mouse biology and legislative protection to explain concerns to contractors, their employees, and agency personnel involved with implementation of the project. The program shall include the following: a description of the three species and their habitat needs, any reports of occurrences in the action area; an explanation of the status of the Ridgway's rail, California black rail, and salt marsh harvest mouse and their protection under state or federal Endangered Species Acts; and a list of measures being taken to reduce impacts to these species during the work. Fact sheets containing this	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		information shall be distributed to all involved in the training. f. If any rail or mouse species is observed at any time during construction, work will not be initiated or will be stopped immediately by the biological monitor(s) until the rail or mouse leaves the vicinity of the work area on its own volition and the USFWS is notified. If the rail or mouse does not leave the work area, work shall not be reinitiated until the USFWS is contacted and has made a decision on how to proceed with work activities. The biological monitor(s) shall direct the contractor on how to proceed accordingly. The biological monitor(s) or any other persons at the site will not pursue, capture, handle or harass any rail or mouse observed. g. Biological monitor(s) shall ensure that construction work is scheduled to avoid extreme high tides when there is potential for salt marsh harvest mice to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use. h. All personnel and any equipment shall be required to stay within the designated work sites and access corridors to perform job-related tasks, and shall not be allowed to enter adjacent salt marsh wetlands, drainages, and habitat of listed species. Pets shall not be allowed in or near the work site. Firearms would not be allowed in or near the work sites. No intentional killing, harassment, or injury of wildlife shall be permitted. The work sites shall be maintained in a clean condition. All trash (e.g., food scraps, cans, bottles, containers, wrappers, cigarette butts, and other discarded items) shall be placed in closed containers and properly disposed of off-site on a daily basis. Trash cans shall be "bear proof" to reduce the amount of waste available to vermin and other predators. No fires shall be permitted in any of the work sites. i. Interpretative signage shall be placed along the Bay Trail to encourage public awareness of wetlands ecology, endangered species life histories, species/predator interactions, and how predation of sensitive species can be minimized. Additional	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		signs shall be placed at various points to remind users of the Bay Trail with respect to a prohibition on dogs within the project area during the construction phase of the project. j. Use of the Bay Trail along the shoreline shall be limited to pedestrians, bicycles, and battery operated wheelchairs or other similar mechanisms associated with access for disabled individuals. k. Appropriate erosion control materials such as silt fence and straw rolls will be installed as needed during construction activities within the project area. l. Hazardous materials used during the work period (e.g., fuels, lubricants, solvents, etc.) shall be controlled, cleaned up, and properly disposed of outside the tidal marsh areas. Refueling areas for any equipment will be located at upland sites outside of wetlands. m. After construction, a final clean-up would include removal of all refuse generated by the work. Vegetation would not be removed or disturbed in the clean-up process. n. If requested, before, during, or upon completion of construction, the contractor shall allow access by USFWS personnel to the work areas to inspect effects, if any, of the actions on the salt marsh harvest mouse or Ridgway's rail. o. Subsequent to construction, the contractor shall submit a compliance report, prepared by the biological monitor(s), to the USFWS within 60 days after completion of the work. This report will detail the dates the work occurred; information concerning the success of the actions in meeting the recommended mitigation measures; any effects on the salt marsh harvest mouse and Ridgway's rail; documentation of the worker environmental awareness training; and any other pertinent information. <u>BIO-1b</u>: In order to minimize potential effects to salt marsh harvest mouse, Ridgway's rail, and California black rail resulting from installation of sheet pile walls in areas adjacent to suitable habitats	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		for these species, the City of Foster City Public Works Department, and/or the project team shall implement the following: a. To provide high tide refuge and cover for Ridgway's rail, California black rail, and salt marsh harvest mouse, vegetation shall be planted along the bayside of the sheet pile wall in all areas adjacent to salt marsh habitats where sheet pile is installed along the levee. A Detailed Vegetation Planting Plan shall be submitted to the USFWS within 60 days of the start of construction. The Detailed Vegetation Planting Plan shall include establishment of high marsh vegetation (including the planting of gum plant and pickleweed), monitoring period, performance criteria, and erosion control measures. b. Nixalite spikes or other USFWS-approved perching prevention device will be applied to the top of the sheet pile wall in all areas of the levee where sheet pile walls are installed adjacent to salt marsh habitats.	
BIO-2: Project construction could introduce invasive, non-native plants into the project area.	S	BIO-2: Landscaping will be designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site. Where appropriate, vegetation removed as a result of project activities will be replaced with native species which are of value to local wildlife, and native vegetation will be retained. If deemed necessary by the Public Works Department, weed management practices shall be implemented, including identification and removal of infestations of noxious weeds prior to construction, use of construction equipment and materials such as fill and erosion control devices that are known to be weed-free, power washing of construction vehicles to remove mud, dirt and vegetative material before working in relatively weed-free areas, and removal of invasive species from areas within the project boundary set aside for open space uses.	LTS
BIO-3: The Levee project would permanently impact federally protected wetlands under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise	S	BIO-3: The City of Foster City Public Works Department and/or the project team shall submit applications for a Section 404 Clean Water Act permit from the USACE and for a Section 401 water quality certification from San Francisco Bay RWQCB, required for the	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
scenario.		USACE permit to be valid. Under the 2050 Sea Level Rise scenario, impacts would be less than 0.5 acres (estimated at 0.48 acres) and the permit from USACE is anticipated to be a Nationwide Permit. Under the 2100 Sea Level Rise scenario, the impacts of greater than 0.5 acres (estimated at 1.15 acres) would require that the City obtain an Individual Permit from USACE. It is anticipated that applications for these permits would be submitted to the respective agencies sometime in early 2017. Appropriate wetland mitigation would be required by the USACE and RWQCB for impacts to the 0.48 acres of Palustrine Emergent Wetland under the 2050 Sea Level Rise scenario and for impacts to 1.15 acres of Palustrine Emergent Wetland under the 2100 Sea Level Rise Scenario. A wetland mitigation plan to mitigate impacts to jurisdictional areas shall be developed as part of the USACE and RWQCB permit process. USACE jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably at a Mitigation Bank) to ensure that no net loss of acreage or functions and values to these areas occurs. The required ratio of replacement acreage to impacted acreage is decided by regulatory agencies on a project-specific basis based on the functions and values present on the project site, but requirement for a mitigation ratio of 2:1 (estimated at 0.96 acres for the 2050 Sea Level Rise scenario, and 2.3 acres for the 2100 Sea Level Rise scenario) would be likely. To offset the wetland impacts, the Permittee shall either: (1) purchase mitigation credits equivalent to 0.96 acres (2050 Sea Level Rise scenario) or 2.3 acres (2100 Sea Level Rise scenario) from an authorized mitigation bank; or (2) implement a Permittee-responsible mitigation plan and establish or restore wetlands within uplands along the levee alignment. If Permittee-responsible mitigation is implemented, a detailed mitigation plan shall be prepared that includes monitoring and reporting requirements, responsibilities, performance standards, reporting procedures, contingency plan, and plan to ensure long-term protection through real estate instruments or other available mechanisms, as	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		appropriate. A Permittee-responsible mitigation plan shall consider means of incorporating an ecotone levee or horizontal levee feature consisting of a gently sloped levee designed to mimic the transition from wetlands to uplands and that shall provide flood protection, wildlife habitat (including transitional and refugial habitat for Ridgway's rail and salt marsh harvest mouse) as well as water quality benefits. Such a levee may be feasible in areas adjacent to the City's Phase II Sedimentation Basin in the southern portion of segment 5 and the eastern portion of segment 6.	
BIO-4: Project construction involving vegetation removal during the bird nesting season could result in bird mortality or nest failure, and project construction could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream.	S	BIO-4a: If feasible, construction work shall take place outside of the February 1 to August 1 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist shall conduct a pre-construction breeding bird survey in areas of suitable habitat within 15 days prior to the onset of construction activity. If bird nests are found, appropriate buffer zones shall be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones should be determined in consultation with wildlife agency staff based on site conditions and species involved. Buffer zones shall be maintained until it can be documented that either the nest has failed or the young have fledged. BIO-4b: Best Management Practices (BMPs) and all requirements as detailed in the Stormwater Pollution Prevention Plan (SWPPP) shall be implemented to control erosion and migration of sediments off-site. These requirements are necessary along the bayside of the levee for the entirety of the shoreline of San Francisco Bay, Belmont Slough and O'Neill Slough, locations where wetlands are present along the landward side of the levee (e.g., portions of segment 2, segment 3 adjacent to wetlands south of Bridgeview Park, segments 5 and 6 adjacent to the City's Phase II Sedimentation Basin), and along existing wetlands (including mitigation wetlands) at the proposed staging area within the western and northern perimeter levee for the Phase II Sedimentation Basin, including a short section adjacent to the main Foster City Lagoon.	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		Implementation of water quality controls shall be consistent with the BMPs requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. Silt fence in combination with straw wattles shall be installed along both sides of the work areas mentioned above to protect adjacent wetlands from increased sedimentation. In addition, vegetation shall only be cleared from the permitted construction footprint. Areas cleared of vegetation, pavement, or other substrates shall be stabilized as quickly as possible to prevent erosion and runoff.	
D. CULTURAL RESOURCES			
CULT-1: The Levee project could cause a substantial adverse change in the significance of an archaeological resource.	S	CULT-1: Protection of archaeological resources encountered during construction. If archaeological materials are discovered during the course of construction, all work in the vicinity of the find shall stop. Project personnel shall not collect, move, or otherwise alter archaeological materials. A qualified professional archaeologist shall be retained to assess the find and make recommendations regarding treatment. Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results of the analysis. Any recommendations by the qualified professional shall be incorporated into a treatment plan that takes into account the nature and scope of the find and is implemented by the project contractor.	LTS
CULT-2: The Levee project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	S	CULT-2: Protection of paleontological resources encountered during construction. If paleontological specimens are discovered during the course of construction, all work within 25 feet of the find shall stop, and a qualified paleontologist shall be retained to document the discovery and evaluate the nature and significance of the find. Upon completion of the assessment, the paleontologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the paleontological resources discovered. If needed, a treatment plan will be developed that takes into account the nature and scope of the find.	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
CULT-3: The Levee project could directly or indirectly disturb human remains, including those interred outside of formal cemeteries.	S	CULT-3: Protection of human remains encountered during construction. If human remains are encountered during construction, the following procedures shall be followed as required by PRC Section 5097.9 and Health and Safety Code Section 7050.5. If the coroner determines that the human remains are Native American, the Native American Heritage Commission shall be notified and a Most Likely Descendant shall be appointed by the commission. A qualified archaeologist, the City, and the Most Likely Descendant shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects as outlined in the CEQA Guidelines (Section 15064.5(d)). The agreement shall take into account the appropriate excavation, removal, recordation, analysis, custodianship, and final disposition of the human remains and associated or unassociated funerary objects.	LTS
CULT-4: The Levee project could cause an adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074.	S	CULT-4: Protection of tribal cultural resources. Consultation with Native American tribes shall continue through completion of the project, pursuant to PRC Section 21074. Native American consultants shall be invited to monitor construction activities within culturally sensitive areas and shall be given the right to inspect sites where human remains are discovered and to determine the treatment and disposition of the remains. The City shall provide requested information and updates to the Native American consultants during the life of the project, including copies of site records, survey reports, or other environmental documents.	LTS
E. SOILS, GEOLOGY, AND SEISMICITY			
GEO-1: Damage to Levee project structures or property could result from unstable soil conditions during the construction period.	S	GEO-1: Implement Mitigation Measures GEO-2a through GEO-2c	LTS
GEO-2: Damage to Levee project structures or property could result from unstable or corrosive soils during the operation period.	S	GEO-2: Implementation of the following three-part mitigation measure would reduce impacts to Levee project structures or property related to unstable and corrosive soils to a less-than-	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		significant level: GEO-2a: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement the following requirements. This mitigation measure requires that prior to the issuance of any grading or construction permits, a final geotechnical investigation report shall be prepared by a qualified Geotechnical Engineer or Certified Engineering Geologist and submitted to the City Building Inspection Division for review and approval. In addition to all other requirements, the final geotechnical investigation report shall specifically provide recommendations to minimize: ▪ The potential for adverse effects to existing utilities, pavements, or other structures caused by loading associated with temporary stockpiles. ▪ The potential damage to structures from total and differential settlement, including damage to or reduction in the flood protection provided by levees, conventional flood walls, and sheet pile walls. ▪ The potential for damage to flood control structures or pavements caused by expected seismic shaking. ▪ The potential for damage caused by soil expansion or corrosion to steel and concrete or any other material that may be placed in the subsurface. The recommendations shall incorporate the information obtained from the final soil analysis. ▪ All design measures, recommendations, design criteria, and specifications set forth in the final geotechnical investigation report shall be implemented as a condition of project approval. GEO-2b: A licensed Geotechnical Engineer, or their representative, shall be retained to review the geotechnical aspects of the design and engineering plans. The Geotechnical Engineer shall be allowed sufficient time to provide the project design team with comments prior to the issuance of the final plans. These comments shall be considered by the Geotechnical Engineer or Certified Engineering Geologist preparing the plans. Where consensus is reached	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		between the two parties, the plans will be modified accordingly. If consensus is not reached, another third-party Geotechnical Engineer shall be retained to make the determination. GEO-2c: A licensed Geotechnical Engineer, or their representative, shall be retained to provide geotechnical observation and testing during all earthwork and foundation construction activities. The Geotechnical Engineer shall be allowed to evaluate any conditions differing from those encountered during the geotechnical investigation and shall provide supplemental recommendations, as necessary which the City of Foster City Public Works Department and/or the project team shall require the project contractor to implement. At the end of construction, the Geotechnical Engineer shall provide a letter regarding contractor compliance with project plans and specifications and with the recommendations of the final geotechnical investigation report and any supplemental recommendations issued during construction. The letter shall be submitted for review to the City Building Inspection Division.	
GEO-3: Levee project structures would be subject to seismic shaking hazards during the operation period.	S	GEO-3: Implement Mitigation Measures GEO-2a through GEO-2c.	LTS
F. GREENHOUSE GAS EMISSIONS			
Implementation of the proposed project would not result in any significant greenhouse gas emissions impacts.			
G. HAZARDS AND HAZARDOUS MATERIALS			
HAZ-1: Levee project construction period activities could result in accidental releases of hazardous materials and/or the disturbance and reuse of soil potentially impacted with hazardous materials that could result in impacts to construction workers, the public, and/or the environment.	S	HAZ-1: Sampling and characterization of soil shall be performed prior to excavation for conventional flood wall construction, including in the area beneath the San Mateo Bridge/SR 92 where aerially deposited lead may be present in soil. The soil sampling and analytical methods shall be selected by a qualified environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional, then submitted to the City of Foster City Public Works Department and/or the project team and the appropriate regulatory agency, if	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		necessary. The environmental professional shall provide recommendations to the project contractor and the City Fire Prevention Bureau, as applicable, for review and approval regarding soil/waste management, worker health and safety requirements, and regulatory agency notifications, in accordance with local, state, and federal requirements. Any recommendations by the environmental professional shall be required to be implemented by the project contractor. A Construction Risk Management Plan (CRMP) shall be prepared by the project contractor to protect construction workers, the public, and the environment from hazardous materials, including potential unknown contamination in the subsurface of the project site. The CRMP shall include the following: 1) Procedures for evaluating, handling, storing, testing and disposing of soil during project excavation activities. 2) A project-specific Health and Safety Plan that identifies hazardous materials to be used at the project site (e.g., oils, grease, and fuels) and hazardous materials identified in soil through sampling; describes required health and safety provisions and training for all workers potentially exposed to hazardous materials in accordance with state and federal worker safety regulations; and designates the personnel responsible for Health and Safety Plan implementation. 3) A contingency plan that shall be applied if previously unknown hazardous materials are encountered during construction activities. The contingency plan shall be developed by the contractor(s), with the approval of the City and/or appropriate regulatory agency, prior to demolition or issuance of the first building permit. The contingency plan shall include provisions that require collection of soil and/or groundwater samples in the newly discovered affected area by a qualified environmental professional prior to further work, as appropriate. The samples shall be submitted for laboratory analysis by a state-certified laboratory under chain-of-custody procedures. The analytical	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		methods shall be selected by the environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional and submitted to the appropriate regulatory agency, if appropriate. The environmental professional shall provide recommendations, as applicable, regarding soil/waste management, worker health and safety training, and regulatory agency notifications, in accordance with local, state, and federal requirements. Work shall not resume in the area(s) affected until these recommendations have been implemented under oversight by the City or regulatory agency, as appropriate. 4) Designated personnel responsible for implementation of the CRMP. The CRMP shall be submitted to the City of Foster City Public Works Department and/or the project team to be reviewed and approved by the Foster City Fire Prevention Bureau for review and approval prior to construction activities. In addition, the following measures shall be implemented: ▪ The contractor(s) shall designate storage areas suitable for hazardous materials delivery, storage, and waste collection. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and federal regulations. In addition, an accurate up-to-date inventory, including Safety Data Sheets (SDSs), shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident. ▪ All maintenance and fueling of vehicles and equipment shall be performed in a designated, bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		spills any time vehicle or equipment fluids are dispensed, changed, or poured. ▪ An Emergency Preparedness and Response Procedures shall be developed and implemented by the contractor(s) for emergency notification in the event of an accidental spill or other hazardous materials emergency during project site preparation and development activities. These procedures shall include evacuation procedures, spill containment procedures, and required personal protective equipment, as appropriate, in responding to the emergency. The contractor(s) shall submit these procedures to the City for approval prior to demolition or development activities. ▪ If the presence of subsurface hazardous materials is confirmed at the project site, site remediation may be required by the applicable state or local regulatory agencies. Specific remedies would depend on the extent and magnitude of contamination and requirements of the regulatory agency(ies). Under the direction of the regulatory agency(ies) and the City, a Site Remediation Plan shall be developed by the project contractor, if determined necessary by the regulating agency(ies) and implemented. The Site Remediation Plan shall: (1) specify measures to be taken to protect workers and the public from exposure to the potential hazards; and (2) certify that the proposed remediation would protect the public health in accordance with local, state, and federal requirements, considering the land use proposed. Excavation and earthwork activities associated with the proposed project shall not proceed until the Site Remediation Plan has been reviewed and approved by the regulatory oversight agency and is on file with the City. ▪ Engineering fill shall be tested prior to being brought on-site to ensure that it would not pose an unacceptable risk to human health or the environment. Threshold criteria for acceptance of engineered fill shall be selected based on screening levels and protocols developed by regulatory agencies for protection of human health and leaching to groundwater (e.g., ESLs). The	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		engineered fill shall be characterized by representative sampling in accordance with the Environmental Protection Agency's (EPA) SW-846 Test Methods and in accordance with the Department of Substance Control's (DTSC) Information Advisory for Clean Imported Fill Material (2001 or most recent version). Fill testing shall be performed by a qualified environmental professional and demonstrated to meet the appropriate threshold criteria. The results of the sampling and waste characterization shall be submitted by the contractor(s) to the City prior to construction. ▪ The contractor shall prepare a Waste Disposal and Hazardous Materials Transportation Plan for City approval prior to construction activities and implement the Plan during demolition and construction activities. This plan shall describe the analytical methods for characterizing wastes and the handling methods required to minimize the potential for exposure, and shall establish procedures for the safe storage of contaminated materials and stockpiling of soils. The required disposal method for contaminated materials, the approved disposal site, and specific routes used for transport of wastes to and from the project site shall be indicated. The Waste Disposal and Hazardous Materials Transportation Plan may be prepared as an addendum to the Waste Management Plan required by Chapter 15.44 (Ordinance 523) of the Foster City Municipal Code. ▪ Hazardous materials and wastes generated during demolition, grading, and trenching activities, shall be removed, managed, and disposed of in accordance with applicable regulations. Compliance with existing regulations and implementation of Mitigation Measure HAZ-1 would ensure that impacts associated with potential releases of hazardous materials are less than significant.	
HAZ-2: Construction of the improved levee could interfere with the use of the emergency response/evacuation routes.	S	HAZ-2*:* Prior to the start of construction, the contractor shall develop a plan to ensure that sufficient access for emergency vehicles, including fire engines and trucks, and emergency evacuation is maintained at all times during construction activities	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		at the fire access roads and evacuation routes impacted by construction of the proposed project, by constructing temporary bypasses adjacent to the fire access roads and evacuation routes. The contractor shall coordinate with the Foster City Police Department and Fire Department to design the temporary bypasses to ensure that they would allow appropriate emergency response and evacuation access. The contractor shall submit the plan to the Foster City Police Department and Fire Department for review and approval. The plan shall outline the notification procedures for informing the Foster City Police Department and Fire Department of when the existing fire access roads and evacuation routes would be blocked and replaced by the temporary bypasses. The plan shall also outline procedures for notification and placement of signage to inform the public of the temporary bypasses for emergency response/evacuation routes.	
H. HYDROLOGY AND WATER QUALITY			
<u>HYD-1</u>: Construction of the proposed Levee project could result in degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay.	S	<u>HYD-1a</u>: The following measures shall be implemented to reduce the risk of spill/releases and disturbed soils from impacting water quality in nearby surface waters during construction activities: ▪ The contractor(s) shall designate storage areas suitable for material delivery, storage, and waste collection. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and federal regulations. In addition, an accurate up-to-date inventory, including Safety Data Sheets (SDSs), shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident. ▪ All maintenance and fueling of vehicles and equipment shall be performed in a designated bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and have leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		spills any time vehicle or equipment fluids are dispensed, changed, or poured. ▪ Construction Best Management Practices (BMPs) related to stormwater pollution prevention shall be included and noted on the construction plans. ▪ The contractor shall implement a Stormwater Pollution Prevention Plan (SWPPP) prepared by a Qualified SWPPP Developer (QSD) and designed to reduce potential adverse impacts to surface water quality during the construction period. The SWPPP shall include the minimum BMPs required for the identified risk level. BMP implementation shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. The SWPPP shall be designed to address the following objectives: 1) All pollutants and their sources, including sources of sediment associated with construction activity are controlled. 2) Where not otherwise required to be under a Regional Water Quality Control Board (RWQCB) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated. 3) Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity. 4) Stabilization BMPs installed to reduce or eliminate pollutants and erosion of exposed soil after construction are completed, which may include but would not be limited to: hydroseeding, planting of vegetation, installation of jute/burlap netting, and installation of swales in graded areas. 5) BMPs shall be designed to mitigate construction-related pollutants and at a minimum, include the following:	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		a. Practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with stormwater. The SWPPP shall specify properly-designed centralized storage areas that keep these materials out of the rain. b. Practices to reduce erosion of exposed soil which may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins. c. If grading must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control (i.e., keeping sediment on the site). End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. Ingress and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional during both dry and wet conditions. 6) The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor, and shall include both dry and wet weather inspections. Monitoring shall be required during the construction period for pollutants that may be present in the runoff that are “not visually detectable in runoff.” ▪ Site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendance list shall be specified in the SWPPP. ▪ A Qualified SWPPP Practitioner (QSP), hired by the City of Foster City Public Works Department and/or the project team, shall be responsible for implementing BMPs at the site (a qualified professional that has the required professional credentials and	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		has passed specific training courses in accordance with the Construction General Permit). The QSP shall also be responsible for performing all required monitoring, and BMP inspection, maintenance and repair activities. The QSP shall retain an independent monitor to conduct weekly inspections and provide written monthly reports to the City of Foster City Public Works Department and/or the project team to ensure compliance with the SWPPP. HYD-1b: The City of Foster City Public Works Department and/or the project team shall require the project contractor(s) to obtain applicable resource agency permits and approvals and comply with permit requirements to prevent impacts to water quality and demonstrate that water quality standards and/or waste discharge requirements are not violated. Permit requirements and avoidance measures that may be required by the U.S. Army Corp of Engineers (USACE) and/or the RWQCB may include, but not be limited to the following: ▪ Installing physical barriers (e.g., silt curtains) to prevent potential localized impacts to water quality (e.g., increase in turbidity) from spreading to surrounding surface waters. ▪ Performing water quality monitoring, including sampling and analysis for turbidity and total suspended solids. At the direction of the applicable resource agency, the results of the water quality monitoring shall be compared to established performance standards. If water quality monitoring indicates that performance standards are not being achieved, additional avoidance measures (e.g., installation of additional silt curtains) shall be implemented until water quality monitoring indicates that performance standards are being achieved, which would mitigate the potential impacts to water quality to a less-than-significant level.	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
I. LAND USE			
Implementation of the proposed project would not result in any significant land use impacts.			
J. NOISE AND VIBRATION			
NOISE-1: Noise from hauling trucks on area roadways associated with Levee project construction could generate noise levels that disturb nearby receptors.	S	NOISE-1: Truck arrival and unloading operations shall be conducted in accordance with all applicable City Ordinance requirements. If noise associated with truck arrival or unloading operations becomes a problem (i.e., multiple complaints are received by the City or its contractors from nearby receptors), the contractor shall work with the City to develop and implement measures to minimize noise, including requiring an adjustment of truck arrival and/or unloading times and other feasible measures. City staff shall communicate regularly with those making the complaints to ensure that the issue is satisfactorily resolved. Mitigation Measure NOISE-1, which requires the development and implementation of a plan to minimize noise (including requiring an adjustment of truck arrival and/or unloading times), would reduce the noise impact from hauling trucks on area roadways to a less-than-significant level.	LTS
NOISE-2: Noise from hauling trucks along the levee associated with Levee project construction could generate noise levels that disturb nearby receptors.	S	NOISE-2: Implement Mitigation Measure NOISE-1	LTS
NOISE-3: The operation of the construction equipment on the Levee project site and in the staging areas could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving).	S	NOISE-3: The following five-part mitigation measure shall only apply to the construction activity along segments 5 through 8 and to any staging areas located within 60 feet of a sensitive receptor under the 2050 Sea Level Rise and the 2100 Sea Level Rise scenarios: NOISE-3a: Residences and landowners within 60 feet of proposed project (those near segment 5 through segment 8, and near any potential staging area) under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario shall be provided with written notice of construction activity within at least seven days of before	SU

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		work begins. The notice shall state the date of planned construction activity in proximity to that landowner's property and the range of hours during which maximum noise levels are anticipated. <u>NOISE-3b</u>: For construction activities that will occur within 60 feet of levee segment 5 through segment 8 and near any potential staging area under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario, City of Foster City shall require the project contractor to submit a Construction Noise Management Plan, prepared by a qualified acoustical consultant, that contains a set of site-specific noise attenuation measures, potentially including the use of mobile sound barriers within the project footprint, to further reduce construction noise impacts, for review and approval by the City of Foster City Public Works Department and/or the project team. <u>NOISE-3c</u>: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement the construction contractor to designate a "noise disturbance coordinator" who shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaints (e.g., beginning work too early, bad muffler) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site. <u>NOISE-3d</u>: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement. The construction activities shall be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays unless deviations from this schedule are approved in advance by the City. Non-construction activities may take place between the hours of 7:00 a.m. and 8:00 a.m. on weekdays and 9:00 a.m. and 4:00 p.m. on Saturdays, but they must be limited to quiet activities and shall not include the use of engine-driven machinery. No actual construction activities may	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		take place between 7:00 a.m. and 8:00 a.m.. Forklifts shall be allowed to operate on site between the hours of 5:00 p.m. and 6:30 p.m. on weekdays. The Planning Commission reserves the right to rescind this condition and further restrict construction activities in the event that the public health, safety, and welfare are not protected due to noise levels emanating from the construction project. NOISE-3e: The construction contractor, to minimize construction noise impacts, shall use all engine-driven construction vehicles, equipment, and pneumatic tools that shall be required to use effective intake and exhaust mufflers; equipment shall be properly adjusted and maintained; and all construction equipment shall be equipped with mufflers in accordance with Cal/OSHA standards. NOISE-3f: The construction contractor shall place all stationary construction equipment such that emitted noise is directed away from sensitive receptors nearest the project site. NOISE-3g. The construction contractor shall locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. Additional factors that would reduce the severity of this impact include the short-term nature of the impact. Exposure of any given receptor to levels of construction noise greater than 100 dBA would be brief relative to the total duration of each construction activity (Table III-3) because the location where the work for each construction activity is occurring would move along the project alignment over time. More specifically, the construction work would move along the project alignment at a speed of approximately 100 feet per day. Therefore, each phase of the construction work would be expected to last no more than one day within 60 feet of any given residence.	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		Implementation of the five-part mitigation measure NOISE-3 would reduce construction period noise to the extent feasible. However, the construction of the proposed project could still generate noise levels that conflict with the City of Foster City Municipal Code regulations at the producer's property plane temporarily. Therefore, the impact of noise from construction equipment on the project site and in staging areas would conservatively remain significant and unavoidable.	
NOISE-4: Construction of the Levee project could result in the exposure of nearby receptors to excessive vibration.	S	NOISE-4a: Implement Mitigation Measure NOISE-3c through NOISE-3g. Implementation of Mitigation Measure NOISE-4a would reduce the impacts of exposure of nearby receptors to vibration. In addition, the construction vibration would be temporary (no more one day at any given residence located within 70 feet of the project site or within 40 feet of staging areas) because the location of work for each construction activity would move along the project alignment as construction progressed. Based on the short-term nature of the potential disturbance, this impact would be less than significant. NOISE-4b: A project contractor or other qualified professional shall be retained to prepare a vibration impact assessment (assessment) for residences located within 15 feet near levee segment 8 and within 5 feet of any potential staging area. The assessment shall take into account project-specific information such as the composition of the structures, location of the various types of equipment used during each phase of the project, and the soil characteristics in the project area, to determine whether project construction may cause damage to any of the structures located within 15 feet near levee segment 8 and within 5 feet of any potential staging area. If the assessment finds that the project may cause damage to nearby structures, the structural engineer or other qualified professional shall recommend design means and methods of construction to avoid the potential damage. The assessment and its recommendations shall be reviewed and approved by the City of	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		Foster City. If there are no feasible design means and methods to eliminate the potential for damage, the structural engineer or other appropriate professional shall undertake an existing conditions study (study) of any structures (or, in case of large buildings, of the portions of the structures) that may experience damage. The study will establish the baseline condition of these structures, including, but not limited to, the location and extent of any visible cracks or spalls. The study shall include written descriptions and photographs. The study shall be reviewed and approved by the City of Foster City Public Works Department and/or project team. Upon completion of the project, the structures (or, in case of large buildings, of the portions of the structures) previously inspected will be resurveyed, and any new cracks or other changes shall be compared to pre-construction conditions and a determination shall be made as to whether the proposed project caused the damage. The findings shall be submitted to the City of Foster City Public Works Department and/or project team for review. If it is determined that project construction has resulted in damage to the structure, the damage shall be repaired to the pre-existing condition by the project sponsor, provided that the property owner approves of the repair.	
L. TRAFFIC AND TRANSPORTATION			
<u>TRANS-1</u>: The Levee project would temporarily disrupt pedestrian and bicycle facilities.	S	<u>TRANS-1</u>: The project shall include a Bay Trail closure plan prepared by the project contractor and reviewed by the City of Foster City Public Works Department and/or the project team that includes recommended detour routes, appropriate signage and striping, and public outreach strategies, as detailed in this section for each phase of construction. The Bay Trail closure plan shall be consistent with the standards and guidelines listed below, including the 2014 California MUTCD, the San Mateo County Resource Guide, the Bicycle Technical Guidelines, and Caltrans Standards. Additionally, the closure plan shall include a plan for Memorial Benches currently located along the Bay Trail that would include either re-locating or placing them in the same location (depending	LTS

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		on final design details and final wall heights). Recommended Bay Trail detour routes are shown on Figure V.K-5 for each phase of construction. Detours shall be determined to maintain connectivity of the Bay Trail through Foster City during construction while focusing on user safety. A Construction Management Plan shall also be submitted to the City of Foster City Public Works Department for review and approval prior to the start of construction and shall require construction and haul trucks to leave the project site by 4:00 p.m. on weekdays to avoid traveling during the peak evening commute period (4:00 to 6:00 p.m.) when traffic volumes are the highest. If the project schedule is reduced below the shortest anticipated schedule (1.5 years for the 2050 Sea Level Rise scenario and 2 years for the 2100 Sea Level Rise scenario) the contractor shall submit a final construction-phasing plan to the City of Foster City Public Works Department and/or the project team for review prior to the start of construction. The Bay Trail closure plan shall be implemented and monitored by the project contractor with oversight by the City of Foster City Public Works Department and/or the project team. The closure plan shall comply with 2014 California Manual on Uniform Traffic Control Devices provides standards, guidance, and support for bicycle considerations as part of the temporary traffic control during construction periods. Applicable standards and recommendations for bicycle and pedestrian detour routes include: ▪ Bicyclists shall not be led into direct conflicts with mainline traffic, work site vehicles, or equipment moving through or around the temporary traffic control zone (Section 6D.101(CA)-01-E). ▪ Each detour shall be adequately marked with standard temporary route signs and destination signs (Section 6F.59-01). ▪ If used, the Pedestrian/Bicycle Detour sign shall have an arrow pointing in the appropriate direction (Section 6F.59-11). ▪ Where pedestrian routes are closed, alternate pedestrian routes shall be provided (Section 6G.05-08).	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		▪ When existing pedestrian facilities are disrupted, closed, or relocated in a temporary traffic control zone, the temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility (Section 6G.05-09). ▪ When the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, warning signs shall be used to advise motorists of the presence of bicyclists in the travel way lanes (Section 6D.101(CA)-01-D). ▪ Bicyclists and pedestrians shall not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions (Section 6G.05-05). ▪ When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project, appropriate information and devices shall be used in order to replicate existing conditions for the needs and control of bicyclists through a temporary traffic control zone (Section 6G.05-06a). ▪ The closure plan shall be monitored and implemented by the City and shall also follow additional guidance provided by the San Mateo County Resource Guide for the Education, Funding and Design of Pedestrian and Bicycle Facilities and the Bicycle Technical Guidelines prepared by the Santa Clara Valley Transportation Authority (VTA). The San Mateo County Resource Guide and VTA Bicycle Technical Guidelines reference the Manual on Uniform Traffic Control Devices and Caltrans standards as well as provide best practices. ▪ Long detour routing shall be avoided because of lack of compliance. ▪ Bicycle detour signs shall be used where a pedestrian/bicycle detour route has been established because of the closing of a bicycle facility to through traffic. Advance warning of the detour shall be placed at appropriate locations and clear wayfinding shall be implemented to enable bicyclists to continue safe operation along travel corridor. If the detour route for the pedestrian detour is the same as for the bicycle detour, then the	

TABLE II-1 SUMMARY OF IMPACTS AND MITIGATION MEASURES

Impacts	Level of Significance Prior to Mitigation Measure	Mitigation Measures	Level of Significance With Mitigation Measure
		combination pedestrian/bicycle detour sign (M4-9a) may be used. The City shall approve a contractor prepared detour plan. ▪ Post a sign giving bicyclists advance notice of all bike path closures and of all other detours of more than 0.5 mile. Two weeks' notice of path and roadway closures is recommended. ▪ A schematic of the detour route should be posted at the beginning of the detour if the detour route is complex or there are a lot of non-local users of the facility (e.g., a regional trail). Additional guidance and figures, including appropriate signage and striping for constructions zones and detour routes, is included in Appendix F. The closure plan shall also follow these recommendations for public outreach strategies: ▪ Brochures and Mailers – The brochures and mailers shall contain project-related information, including project description, construction schedule, and detour maps. They shall be printed out and disseminated to Bay Trail users before construction begins. ▪ Social Media – Use appropriate social media sites (Twitter, Facebook, etc.) to target user groups and alert them of the trail closure and detour routes. Work with cycling and pedestrian advocacy groups to craft the most effective messaging. ▪ Press Release – Issue press releases for radio, television, and print media for the planned closures and proposed detours.	
K. RECREATION			
REC-1: Construction of the Levee project would temporarily reduce the availability and access of the Bay Trail.	S	REC-1: Implement Mitigation Measure TRANS-1.	LTS

III. PROJECT DESCRIPTION

This chapter describes the proposed Levee Protection Planning and Improvements Project (CIP 301-657) ("the project") that is being evaluated in this Environmental Impact Report (EIR). The subsections of this chapter describe the project site; provide the regional and planning context, project objectives, and relevant background information; define the details of the project; explain the intended uses of the EIR; and outline the required project approvals, permits, and the Federal Emergency Management Agency (FEMA) levee accreditation process.

A. PROJECT SITE

Foster City is located in San Mateo County, midway between the cities of San Francisco and San Jose. It is bordered by San Francisco Bay to the north and east, the cities of Belmont and Redwood City to the south, and the city of San Mateo to the west. Figure III-1 shows the project site's regional and local context. The project site will be generally located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system that surrounds Foster City along the bayfront with a slight deviation from the existing levee system footprint, and includes six proposed construction staging areas. For the purposes of this EIR, the levee is divided into eight distinct segments to more clearly provide site-specific details.

1. Location and Site Characteristics

Typical Project Site

The project site is an 8-mile curvilinear alignment located along the bayfront within Foster City, including the deviation adjacent to Beach Park Boulevard in segment 4. The site starts at the San Mateo city limit in the north (adjacent to East 3rd Avenue), extends parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and ends adjacent to U.S. Highway 101 in the south at the San Mateo/Belmont city limit.

The site is regionally accessible via U.S. Highway (US) 101 to the East 3rd Avenue exit, as well as California State Route (SR) 92 to the Foster City Boulevard/East Hillsdale Boulevard

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Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-1
Foster City Levee Protection Planning and Improvements Project EIR
Project Location Map

exit. Local access to the site is primarily via East 3rd Avenue to the north, Beach Park Boulevard to the east and southeast, and smaller residential streets to the south.

The entire project site is open to the public as the levee pathway extends the entire length of the project site that is part of the San Francisco Bay Trail (Bay Trail); this trail provides both recreational opportunities and pedestrian/bicycle travel routes for the community. The existing levee consists of both raised earthen levees and concrete floodwalls. The existing elevation of levee berms and concrete walls ranges from approximately 11–13 feet above the North American Vertical Datum of 1988 (NAVD 88).[1,2] The photos below illustrate the existing levee types.

Earthen levee along Beach Park Boulevard

Raised eathern levee with concrete floodwall levee along the Bay Trail adjacent to Rock Harbor Lane

2. Surrounding Land Uses

The project site is located in the city of Foster City and is bordered by San Francisco Bay to the north and east and Belmont Slough to the southeast and south. Foster City, and the surrounding area, is made up of multiple water ways and lagoon systems, including the Foster City Lagoon south and west of the project site. The Marina Lagoon is situated to the west of the two opposite ends of the project site and forms the border with the city of San Mateo, as shown in Figure III-1. Land uses on the landward side of the levee system consist of streets, residential, office and commercial, landscaped open space and recreational, unimproved lots, managed lagoon, muted tidal wetlands, and seasonal wetlands. The San Francisco Bay side of the Foster City levee system consists mostly of fully tidal open water, slough channels, wetlands, and mud flats. A more detailed

[1] Schaaf & Wheeler. 2015a. Foster City Levee Protection Planning Study. February.

[2] A vertical datum is a surface of zero elevation to which heights of various points are referred in order that those heights be in a consistent system.The NAVD 88 consists of a leveling network on the North American Continent, ranging from Alaska, through Canada, across the United States, affixed to a single origin point on the continent. In 1993, the NAVD 88 was affirmed as the official vertical datum in the National Spatial Reference System for the Conterminous United States and Alaska. FEMA's official mapping products use this datum. The NAVD 88 represents height above the Low Mean Sea Level (LMSL) as 6.271 meters.

discussion of existing and planned land uses is provided in *Section V.I, Land Use*, and Figure V.I-1 illustrates the existing land uses on and surrounding the project site.

3. General Plan and Zoning Designation

The General Plan land use classifications for the project site, including staging areas, as established by the Land Use and Circulation Element of the Foster City (the City)'s General Plan,[3] are Open Space, Parks and Recreation, Research/Office Park, Light Industrial, and Waterfront Commercial. The land use classifications for the project site and surrounding area are shown in Figure IV-1, in *Chapter IV, Planning Policy*.

Properties designated as Open Space are typically vacant of structures and improvements. They are mostly maintained in their natural condition, although maintaining pathways or parking areas to enhance public access to open space areas is considered compatible with the open space designation. Properties designated as Parks and Recreation typically are used for improved open space lands whose primary purpose is recreation, and include local and regional parks. Research/Office Park properties are designated to contain office, research and development, and manufacturing establishments whose operations are clean and quiet. Properties designated as Light Industrial include wholesale facilities, storage warehouses and manufacturing, processing, repairing, or packaging of goods. Properties designated as Waterfront Commercial are solely for commercial development directly related to, and that enhances the public use of, the waterfront without damaging environmental effects.

The project site, including staging areas, falls within four zoning designations: Open Space and Conservation District (OSC); Light Industrial/Planned Development District (M-1/PD); Commercial Mix/Planned Development District (C-M/PD); and Open Space and Conservation/Aquatic Development Combining District (OSC/W). A full description of each zoning designation is included in *Chapter IV, Planning Policy*.

B. PROJECT BACKGROUND

The main function of the City's existing 8-mile levee system is to provide flood protection; however, the Bay Trail situated on top of or immediately adjacent to the levee also serves recreational purposes. Approximately 9,000 individual properties in Foster City rely on the existing levee system for flood protection. An additional 8,000 individual properties within the city of San Mateo are also protected, in part, by the Foster City levee system (i.e., if the Foster City levee was not in place, flood waters associated with storm surge and extreme high tides in San Francisco Bay could flow overland through Foster City, reaching San Mateo from the east and southeast). Similarly, properties in Foster City

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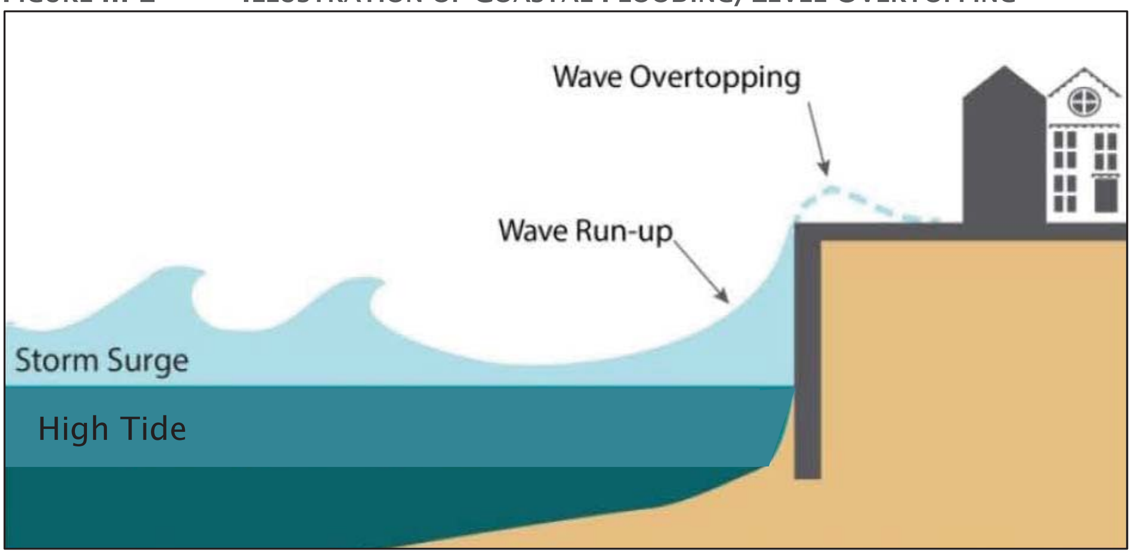
[3] City of Foster City. 2016c. *General Plan, Land Use and Circulation Element* adopted February 1.

receive flood protection benefit from San Mateo's levee and floodwall systems south of San Mateo Creek.[4]

Several processes and conditions can contribute to coastal flooding (and in locations surrounded by levees, levee overtopping). High tides and storm surges can raise water levels to the point that coastal areas are flooded or levees are overtopped. In addition, the energy associated with waves (wave run-up) can propel water up and over coastal barriers that would otherwise provide adequate protection from high tides and storm surges (as shown in Figure III-2). A more detailed discussion of coastal processes and flooding hazards is included in *Section IV.H, Hydrology and Water Quality*.

FIGURE III-2 ILLUSTRATION OF COASTAL FLOODING/LEVEE OVERTOPPING



Source: City and County of San Francisco Sea Level Rise Committee, 2014.

FEMA accredits a levee as providing protection from a 100-year flood—an annual 1-percent chance of flood—if the certification (requisite documentation signed and sealed by a registered professional engineer) and adopted operation-and-maintenance plan provided by the levee owner are confirmed by FEMA to be adequate. FEMA requires accredited levees to provide freeboard, i.e., additional levee height above the 100-year flood elevation needed to compensate for the many unknown factors that could contribute to greater-than-expected flood elevations.

In February 1976, the U.S. Army Corps of Engineers (USACE) Section 404 Clean Water Act (CWA) Regulatory Program (Permit No. 9318-49) initially authorized improvements to the

[4] Schaaf & Wheeler, 2015a. Foster City Levee Protection Planning Study. February.

Foster City levee system to protect properties interior of the levee from flooding due to levee overtopping either from high tides and/or wave run-up. The levee has been subsequently improved over time in order to maintain FEMA levee accreditation.

Foster City's levee system was last re-accredited by FEMA in 2007. Foster City is also protected from flooding by the bayfront levee system in the city of San Mateo. In 2011, the city of San Mateo improved its levee system south of San Mateo Creek and received FEMA accreditation in March 2012. That accreditation is still recognized.

The currently effective Flood Insurance Rate Maps (FIRMs) show all of Foster City, with the exception of the Central Lagoon, in Zone X. Zone X denotes moderate-to low-risk flood hazard areas protected from the 100-year flood, including areas protected by levees. Within Zone X, the National Flood Insurance Program floodplain management regulations do not require the purchase of federally mandated flood insurance. If for any reason the levee were to lose its accreditation, the area would be re-mapped as a high-risk area, known as a Special Flood Hazard Area. Such a case would require that National Flood Insurance Program floodplain management regulations be enforced and the federal mandatory purchase of flood insurance would apply.

In July 2014, FEMA completed the Central San Francisco Bay Coastal Flood Hazard Study as part of the California Coastal Analysis and Mapping Program (CCAMP). Results of the study will be used by FEMA to revise the FIRMs for San Francisco Bay communities, which include Foster City; the new FIRMs are anticipated to be released in mid-2017. The Coastal Flood Hazard Study indicated that approximately 85 percent of Foster City's levees are freeboard deficient and will not retain FEMA accreditation unless improvements are made. In December 2014, the City hired Schaaf & Wheeler, a water resources engineering firm, to prepare a Levee Protection Planning report to identify the City's flood risk and determine potential levee improvement alternatives that may be necessary to restore FEMA accreditation. The Schaaf & Wheeler report concluded that the levee surrounding Foster City would have to be raised to meet FEMA accreditation requirements.[5]

The proposed project would provide flood protection in accordance with updated FEMA guidelines and to retain FEMA levee accreditation. If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San Mateo could be placed within a FEMA-designated Special Flood Hazard Area due to the risks associated with levee overtopping. This project was originally presented to the City Council at a study session on March 23, 2015. A subsequent kick-off meeting to discuss project objectives and preliminary levee improvement design options with representatives of regulatory agencies and several state politicians was held in Foster City on August 28, 2015. A City Council special meeting was held on July 27, 2015 in which the City Council directed staff

[5] City of Foster City, 2015a. Staff Report on FEMA Coastal Flood Hazard Study and Levee Protection Planning for Foster City. March.

to proceed with the hybrid design of using sheet piles and earthen backfill for the levee improvement construction alternative. Another special meeting was held on August 28, 2015 with updates on the project by Public Works Director Jeff Moneda and Schaaf & Wheeler. On September 8, 2015, professional services agreements were approved for Schaaf & Wheeler Consulting Engineers (to provide professional services, including preliminary design and environmental regulatory permitting), SCI Consulting Group (to provide feasibility analysis and a public opinion survey assessment), and Kitahata & Company and William Euphrat Municipal Finance, Inc. (to provide municipal financial advisory services). Additionally, on October 19, 2015 at a City Council meeting, a professional services agreement was approved for Urban Planning Partners, Inc. to prepare an EIR for the project.

A scoping session was held at a Planning Commission meeting on February 4, 2016, which allowed the public to comment on the scope of the Levee EIR. A City Council meeting was held on February 16, 2016 to discuss the approval of a professional service agreement with Straddling Yocca Carlson and Rauth to serve in the Capacity of Bond Counsel for the project and to appropriate funds from the City Capital Projects Fund. A special City Council study session was held on February 22, 2016, which included a draft project presentation from Schaaf & Wheeler for comments from the City Council.

In 2016, the City initiated an outreach program to engage and receive input from the community on the levee project. On April 4, 2016, a City Council meeting was held to discuss public outreach for the project. An approved presentation was then presented at two separate community meetings held at the City Council Chambers on April 21, 2016 (for the residential community) and May 12, 2016 (for the business community). The City's Public Works Director also met with the Foster City Rotary Club on August 17, 2016. Additionally, the Basis of Design Overview report, prepared by Schaaf & Wheeler, was presented at a City Council hearing on October 17, 2016 and at a community meeting on October 27, 2016 with residents on Beach Park Boulevard where the roadway is to be shifted (for the deviation from the exiting levee along segment 4) thereby eliminating parking on the east side of the roadway. The precise design and elevation of the levee is not yet finalized; the City and its engineering consulting team are currently analyzing the two options and evaluating costs/benefits related not only to flood protection (current and future under various sea level rise scenarios) but also community benefits and compromises (e.g., potential effects of a higher levee on shoreline access and views) and environmental impacts.

For Foster City to retain its Zone X designation while the levee modifications are underway, the City has accepted "seclusion mapping" for the areas protected by the Foster

City and San Mateo levee systems.[6] The goal of this designation is to allow the City time to raise funds; complete the design, environmental review, and approval process; obtain all permits from responsible agencies; and construct on improvements without impacting the residents with mandatory flood insurance policy requirements and decreased property values.

1. FEMA Freeboard Requirements and Adapting to Future Sea Level Rise

Determining the appropriate elevation of the earthen levee and height of the floodwall system is a critical design element of this project because it will affect the level and duration of flood protection provided and have potential direct effects on the community, including potential impacts related to shoreline access, views, and biotic resources, among others.

The current elevation of the Foster City levee ranges from 11–13 feet NAVD 88. To achieve the projects main objectives (retain FEMA levee accreditation), the minimum elevation of the modified levee would need to range from 12.5–16.5 feet NAVD 88. The minimum required elevation varies for different segments of the levee because the maximum wave run-up elevation also varies for different segments of the levee. To achieve another objective (provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future, as needed), the modified levee elevation would need to be greater than the elevation needed to retain FEMA accreditation to provide flood protection (from 13.5–21.6 feet NAVD 88). Recommended sea level rise planning scenarios for Foster City are presented in Table III-1 below.

TABLE III-1 RECOMMENDED SEA LEVEL RISE PLANNING SCENARIOS

Year	Projected Sea Level Rise (Feet)
2050	1.25
2100	3.83

Source: Schaaf & Wheeler. 2015. Foster City Levee Protection Planning Study. February.

C. PROJECT OBJECTIVES

The purpose of the Levee Protection Planning and Improvements Project is to retain FEMA accreditation for the City's existing levee system. In addition, the City's levee

[6] The seclusion mapping process was developed by FEMA to allow the release of impacted FIRM updates prior to conducting a more detailed analysis on non-accredited levee systems. Levee seclusion mapping will maintain the flood hazard information as depicted on the current effective FIRM with map notes explaining that these flood hazards will be updated when the updated levee analysis and mapping approach is applied.

improvement plan, once implemented to achieve the project purpose, would also provide some level of sea level rise protection (as well as flexibility to adapt to increased levels of protection in the future) while maintaining public access along the levee system and protection for sensitive habitat and species.

The City's objectives for implementation of the levee improvement design are as follows:

1. Meet current FEMA standards.
2. Expedite permitting and construction of necessary levee improvements to the extent feasible to retain FEMA levee accreditation before such accreditation is lost.
3. Provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future, as needed.
4. Maintain public access and recreational opportunities.
5. Minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and State (including wetlands) on the bayside of the existing levee.
6. Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the existing levee.
7. Avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal and State-listed species to the maximum extent feasible.

D. PROPOSED PROJECT

As previously mentioned, the environmental analysis will study two scenarios at an equal level of detail with different ranges of levee/floodwall elevations as needed to meet FEMA freeboard requirements and protect against future sea level rise. The two scenarios are as follows:

1. FEMA freeboard with sea level rise for the year 2050 (hereafter referred to as "2050 Sea Level Rise").
2. FEMA freeboard with sea level rise for the year 2100 (hereafter referred to as "2100 Sea Level Rise").

Based on currently available data, preliminary evaluations, and City Council direction, the City anticipates that the project will utilize a combination of three different levee improvement types, depending on the location along the existing levee and the adjacent site constraints. The three levee improvement types are as follows:

1. Sheet pile floodwall
2. Earthen levee

3. Conventional floodwall

A hybrid approach (combination of types 1, 2, and 3) would provide the most flexibility to meet current FEMA standards and retain FEMA accreditation. It is anticipated that the majority of levee reaches would be improved with sheet pile floodwalls due to several factors: (1) limited width of the City-owned right-of-way; (2) avoidance of environmental impacts; (3) constructability; (4) adaptability to future sea level rise; and (5) cost-effectiveness. Additionally, in certain levee reaches where there is limited space for installing a sheet pile floodwall and raising the levee with additional fill (which requires expanding the width of the levee), a secondary sheet pile floodwall would be installed (see Figure III-6). The earthen type levee is planned to be utilized within sub-reaches where there is sufficient land for an expansion of the levee base, and where such a design would help maintain views along the Bay Trail, provide public access to the shoreline, and/or provide unobstructed access corridors for wildlife to adjacent areas on the landward side of the levee during flood events. Lastly, the conventional floodwall is planned within sub-reaches where constraints make the two other options infeasible (e.g., under the San Mateo Bridge/SR 92 and along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee).

1. Project Scenarios

Potential approximate locations for each levee improvement type (sheet pile floodwall, earthen, and conventional floodwall) are illustrated in the 2050 Sea Level Rise scenario (shown in Figure III-3) and in the 2100 Sea Level Rise scenario (shown in Figure III-4). As shown in Figures III-3 and III-4, no levee improvements are proposed under either scenario along the Mariners Point Golf Center because the land at this location is adequately elevated to provide the necessary flood protection and is considered elevated ground rather than a levee.

A matrix with existing levee/floodwall elevation(s), proposed levee/floodwall elevation(s), and improvement type(s) for each levee segment is provided in Table III-2.

a. 2050 Sea Level Rise Scenario

As shown in Figure III-3, the sheet pile floodwall would be used for the majority of the levee under the 2050 Sea Level Rise scenario for at least 5 miles of the 8-mile alignment. A secondary wall would be installed along East 3rd Avenue and along Beach Park Boulevard adjacent to the deviation to retain the raised Bay Trail where space is limited. The deviation from the existing levee/Bay Trail would result in the loss of parking on the bayside of Beach Park Boulevard between Swordfish Street and the northern edge of Shorebird Park. The earthen levee would be used at three different locations: (1) along East 3rd Avenue near Mariners Point Golf Center; (2) along the Foster City Lagoon Dredge

TABLE III-2 LEVEE MATRIX

Segment	Segment Length	Existing Levee Elevation	Levee/Floodwall Elevations for 2050 Sea Level Rise	Levee/Floodwall Elevations for 2100 Sea Level Rise	Proposed Levee Improvement Type for 2050 Sea Level Rise	Proposed Levee Improvement Type for 2100 Sea Level Rise
1	1,318.6	>13	15	18.5	Earthen	Sheet Pile
2	6,518.4	12–13	19	22	Conventional/Sheet Pile	Conventional/Sheet Pile
3	6,344.8	12–13	18	21.5	Sheet Pile	Sheet Pile
4	4,031.4	11–12	13.5–18	16–21.5	Sheet Pile	Sheet Pile
5	3,640.5	12	13.5	16	Earthen/Sheet Pile	Sheet Pile
6	2,537.0	12	13.5	16	Earthen/Sheet Pile	Sheet Pile
7	3,750.9	12–13	13.5	16	Earthen/Sheet Pile	Sheet Pile
8	3,836.1	12–13	13.5	16	Earthen/Conventional/ Sheet Pile	Conventional/Sheet Pile

Note: Segment length in linear feet. All elevations are shown in Feet NAVD 88.
Source: Schaaf & Wheeler, 2016.

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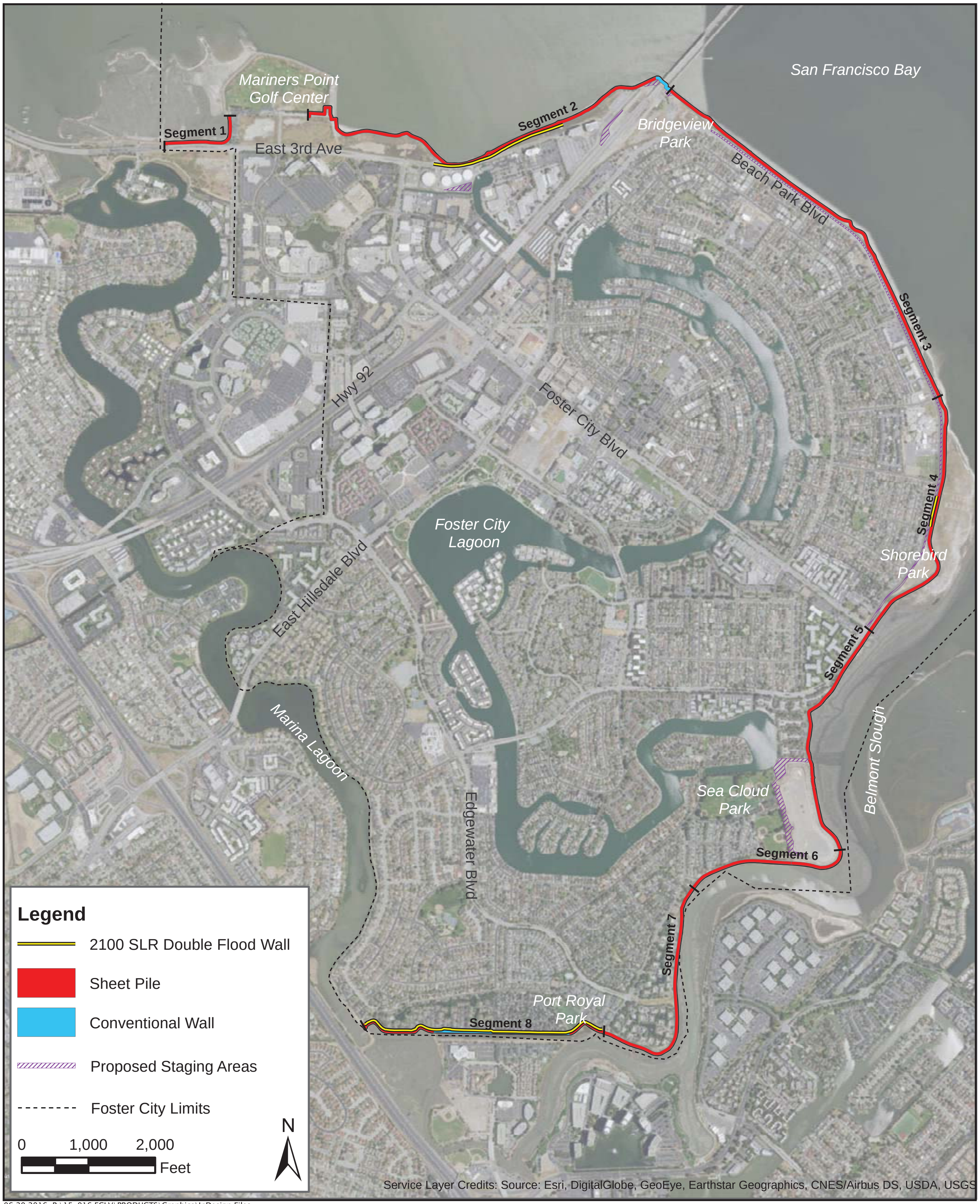
Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-3

Foster City Levee Protection Planning and Improvements Project EIR

Levee Improvement Type (2050 Sea Level Rise Scenario)



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Source: Schaaf & Wheeler, Urban Planning Partners, 2016
Note: The location of staging areas are preliminary and may change.

Figure III-4
Foster City Levee Protection Planning and Improvements Project EIR
Levee Improvement Type (2100 Sea Level Rise Scenario)

Disposal Site[7] adjacent to Sea Cloud Park; and (3) near Port Royal Park. The conventional floodwall improvement option would be used under the San Mateo Bridge/SR 92 (due to limited vertical access and the inability to drive piles under the bridge) and along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee (due to limited space). Due to limited vertical clearance under the San Mateo Bridge/SR 92, it would be difficult to install the sheet piling (temporary or permanent) needed to protect the construction site from inundation during periods of high tide or wind wave activity in this area. However, the mean higher high tide is still about 5 feet below the existing top of levee at this location. Therefore, excavations for the floodwall foundation up to 5 feet deep would be subject to inundation in only the more extreme tidal events, and the construction risk is tolerable. Temporary flood barriers would, however, be installed adjacent to the Bay Trail outside the bridge footprint to provide an equivalent level of flood protection to property within Foster City.

For the 2050 Sea Level Rise scenario with the option to adapt to future sea level rise, a floodwall suitable for the 2100 Sea Level Rise scenario would be installed, but with top of levee and floodwall elevations limited to the 2050 Sea Level Rise scenario (13.5–19 feet NAVD 88).

b. 2100 Sea Level Rise Scenario

The 2100 Sea Level Rise scenario differs from the 2050 Sea Level Rise scenario in that the levee elevation would be 2.5–3.5 feet higher and more areas of the levee would require the sheet pile floodwall improvement type. Additionally, a secondary wall would be used for levee reaches in the north along East 3rd Avenue, the east along Beach Park Boulevard adjacent to the deviation, and in the south, starting from Port Royal Park and continuing to the San Mateo/Belmont city limit (where space is limited for expanding the width of the levee). The deviation would result in the loss of parking on the bayside of Beach Park Boulevard between Swordfish Street and the northern edge of Shorebird Park. As shown in Figure III-4, the earthen levee improvement type would be replaced by the sheet pile floodwall entirely. As a result, the sheet pile floodwall would be used for at least 7 miles of the 8-mile alignment. The conventional floodwall improvement type would only be used under the San Mateo Bridge/SR 92 and along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee, as described in the 2050 Sea Level Rise scenario.

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[7] The Foster City Lagoon Dredge Disposal Site is a 19-acre area located between the Bay Trail/levee and Sea Cloud Park. A portion of the 19-acre site was used as a wetland mitigation site as part of the Foster City Lagoon Dredge Disposal Project in 2004.

2. Levee Improvement Types

Each levee improvement type is described below followed by additional detail related to the methodology for determining the height of the levee improvements.

a. Improvement Type 1: Sheet Pile Floodwall

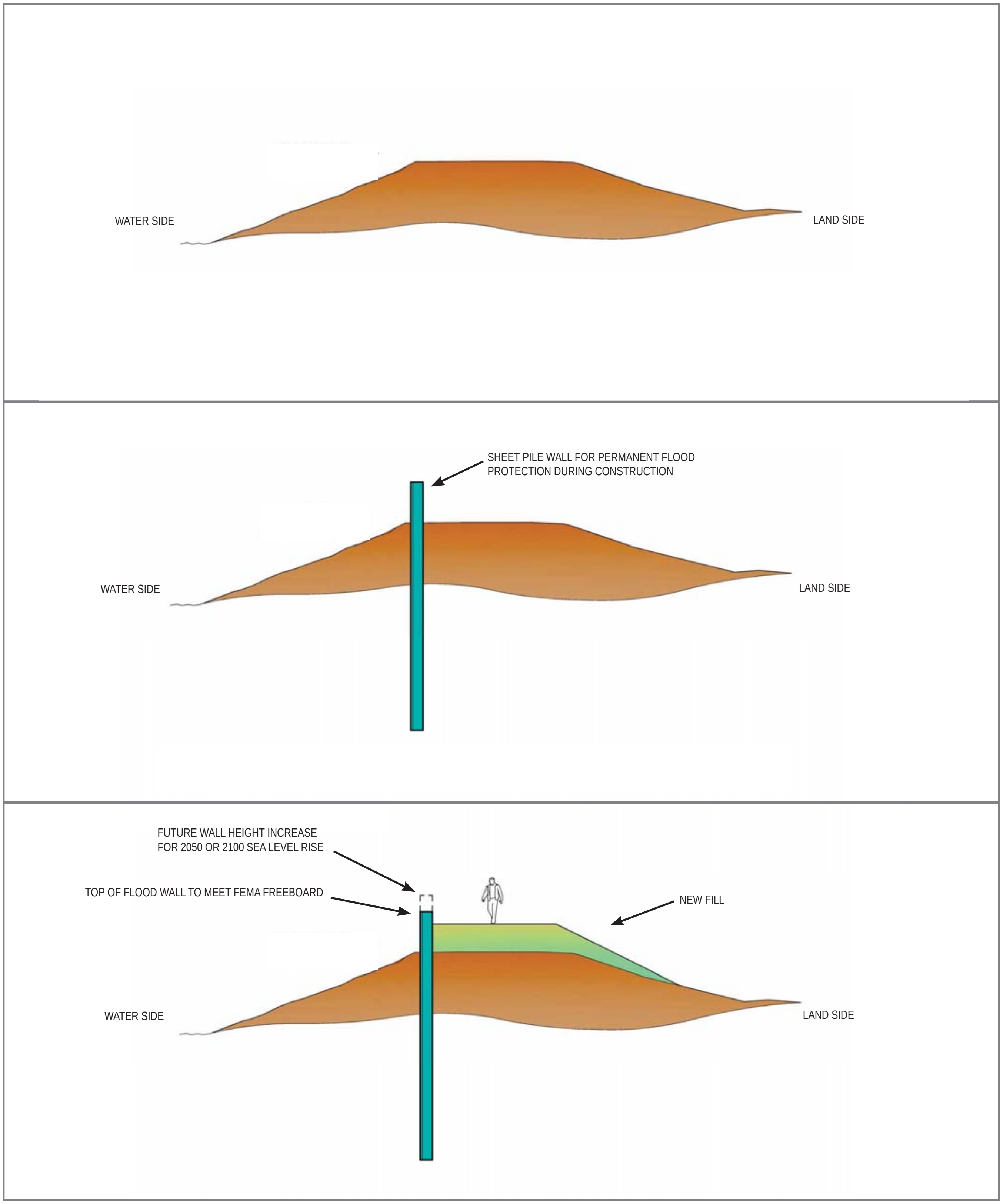
The sheet pile floodwall improvement type uses sheet pile floodwall sections as a permanent flood protection structure. This improvement type is planned where there is insufficient right-of-way width or where encroachment may occur into wetland areas with an alternative design (earthen levee or conventional floodwall) improvement type.

The sheet pile floodwall design would be composed of a vertical wall (likely made of steel or vinyl sheet pile) that varies in height from 1.5–10 feet above the finish grade of the earthen levee and is 12–20 inches wide, depending on the adaptive sea level rise scenario (2050 or 2100) selected for design. The sheet piles would be driven sufficiently deep to provide adequate resistance against deflection from the tide and wave loads, as well as seepage protection. Pending structural confirmation during detailed design, it is anticipated that piles would be driven to approximately 10–20 feet underground. Foundations would only be required for the conventional floodwall (Improvement Type 3). The piles would be driven using vibratory hammers, although percussion hammers or a press-type system may be used in certain locations. Additionally, Best Management Practices (BMPs) would be implemented including the use of silt fence or straw wattles along the shoreline to control erosion and sedimentation into adjacent waters. The earthen levee could then be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. A sheet pile floodwall schematic is shown in Figure III-5.

The sheet pile wall structure could also be designed to accommodate loads from future incremental wall height increases (see dashed line in Figure III-5) necessary to adapt to future sea level rise. Where space is limited along the levee, a secondary retaining wall could be installed on the landward side of the levee with a tieback to the sheet pile floodwall creating a “double floodwall,” as shown in Figure III-6. It would require less right-of-way width than a single sheet pile wall because the fill is confined to the levee crest between the two walls. A safety rail would also be placed on the secondary wall.

b. Improvement Type 2: Earthen Levee

The earthen levee improvement type is planned where there is enough right-of-way width to raise and expand the levee using fill only. For earthen levees, the top of the existing levee would be excavated and conditioned to accept new fill (either conventional or lightweight fill shown as green shading in Figure III-7). The top width of the earthen levee would range from 14–16 feet and 12.5–20.5 feet in elevation (on the NAVD datum) at the



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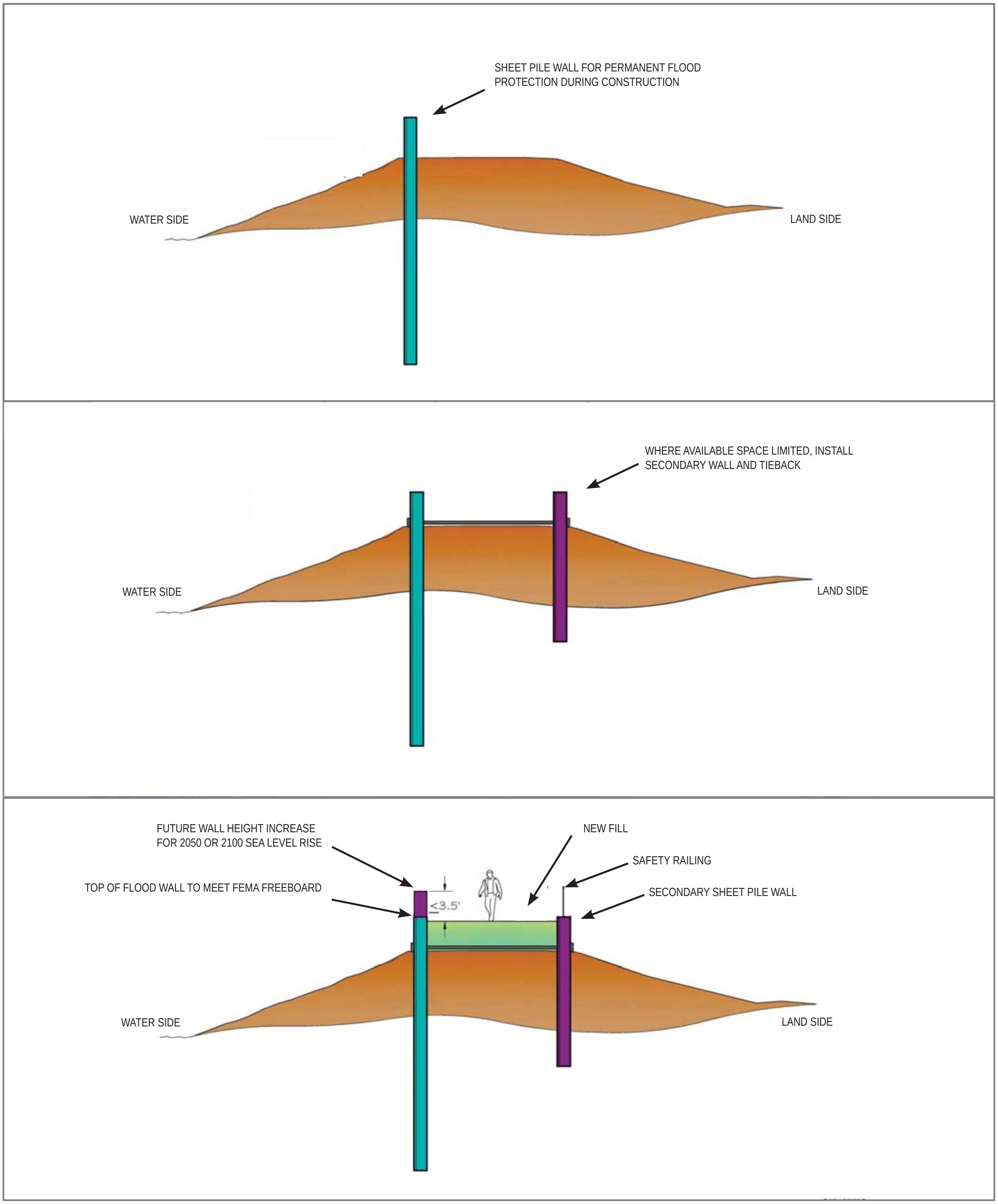
Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Figure III-5
Foster City Levee Protection Planning and Improvements Project EIR
Sheet Pile Floodwall Levee Improvement Type



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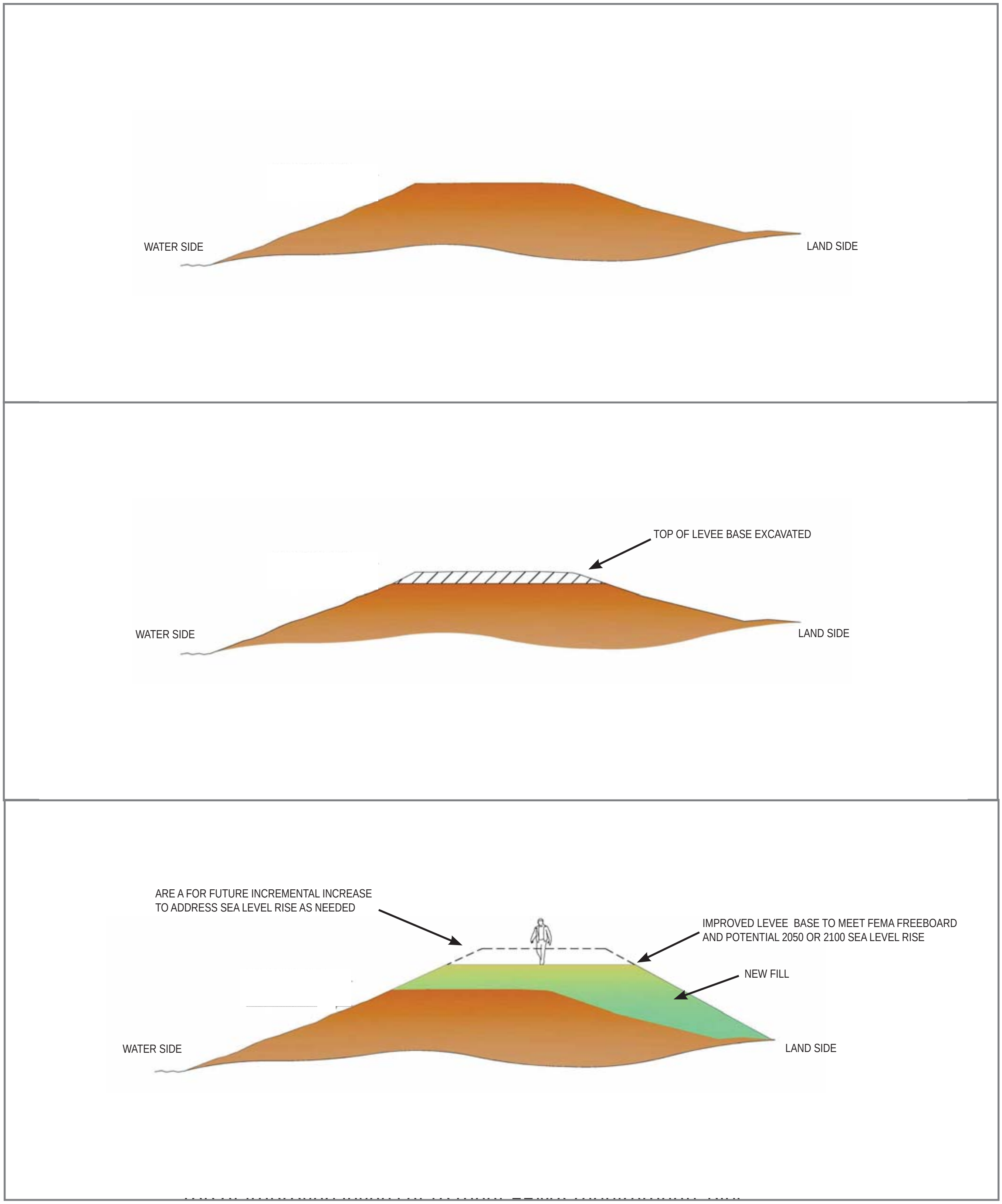
Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Figure III-6
Foster City Levee Protection Planning and Improvements Project EIR
Double Floodwall Levee Improvement Type



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Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Figure III-7
Foster City Levee Protection Planning and Improvements Project EIR
Earthen Levee Improvement Type

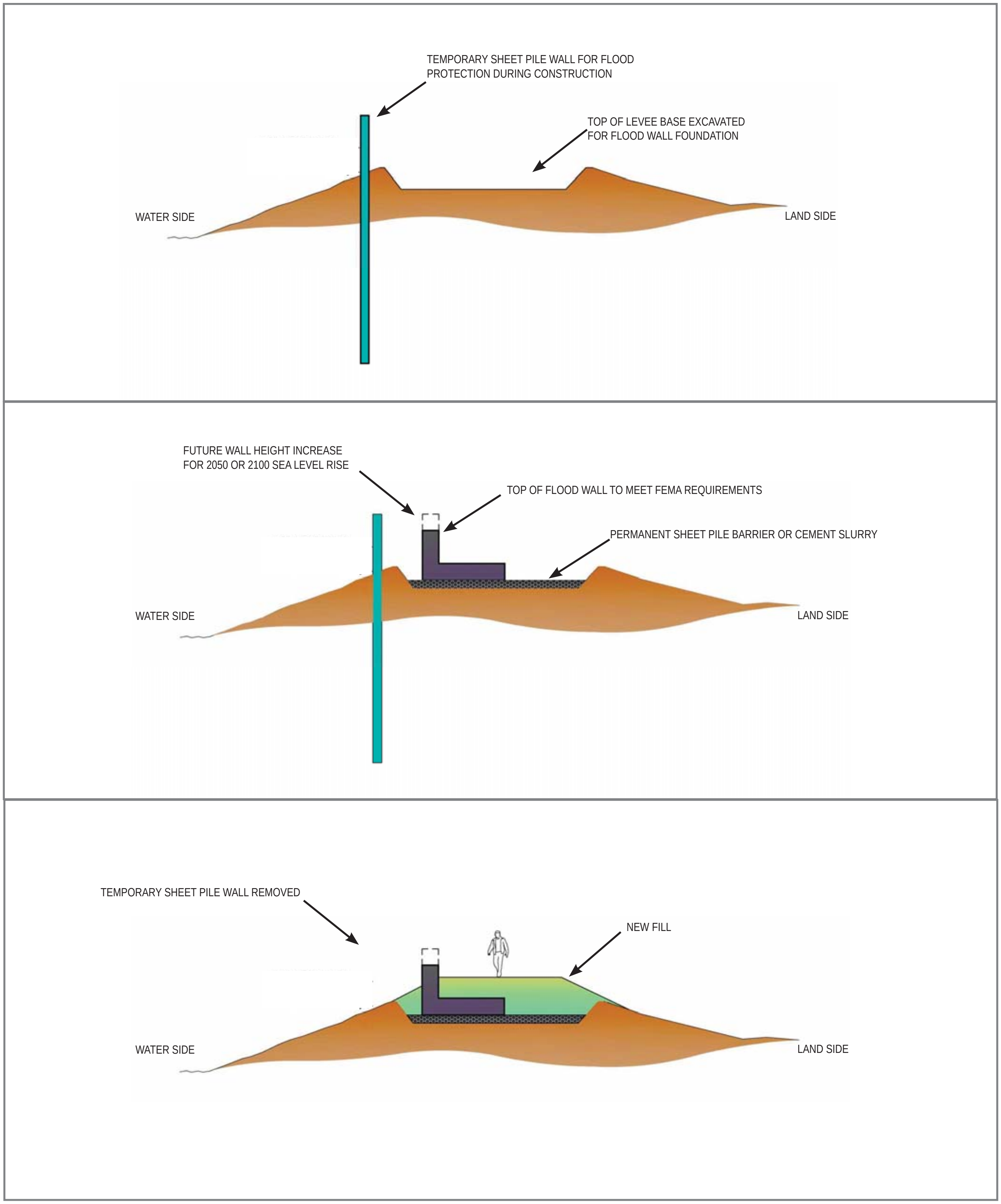
top elevation, depending on the adaptive sea level rise scenario (2050 or 2100) selected for design. The weight of the new fill would result in long-term settlement of the levee, and supplemental fill would be placed during construction to account for future settlement. The base of the improved earthen levee would be expanded to support additional fill (see dashed line in Figure III-7) that may be placed in future years to provide protection against future sea level rise. Two types of fill may be used for earthen levees: conventional fill or lightweight fill. Using lightweight fill would minimize settlement; however, lightweight fill is relatively porous and would require the construction of sheet pile barriers or a clay core to minimize seepage.

c. Improvement Type 3: Conventional Floodwall

Due to limited space and limited vertical clearance under the San Mateo Bridge/SR 92 and limited space along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee for installing sheet pile floodwalls, a conventional floodwall would be used instead at these locations.

The conventional floodwall design would be composed of a vertical wall that varies in height from 4.5–10 feet above the finish grade and is 8–12 inches wide, depending on the adaptive sea level rise scenario (2050 or 2100) selected for design. The wall design includes a foundation that is generally as wide as the wall is tall for adaptive sea level rise protection, as measured from the foundation pending detailed structural design. The floodwall would likely be constructed of concrete, either poured-in-place or unit concrete masonry. The foundation construction would require levee excavation at the top of the existing berm. To ensure that the level of flood protection provided by the existing levee during construction is not compromised as a result of excavation for the foundation, a temporary sheet pile wall would be installed on the water side, as shown in Figure III-8. Temporary sheet pile walls or other temporary flood barriers would not be removed until the permanent installation is completed to its finished elevation.

Modification to the existing levee section below new floodwalls would be necessary if seepage is an issue. Slurry (made of either cement or soil-cement mixed in-situ) or a permanent sheet pile barrier would be installed to prevent seepage, and additional earthen fill (shown as green shading in Figure III-8) may be added to increase the elevation of the trail and reduce the relative height of the wall to preserve views of San Francisco Bay and ensure that the maximum wall height does not exceed 3.5 feet from the grade adjacent to the Bay Trail (except near the San Mateo Bridge/SR 92 where the height would be up to 7 feet under the 2050 Sea Level Rise scenario and 10 feet under the 2100 Sea Level Rise scenario). For the 2050 Sea Level Rise scenario with the option to adapt to future sea level rise, the base of the conventional floodwall structure would be designed to accommodate an increased wall height for the 2050 Sea Level Rise scenario with the option to adapt to future sea level rise (see dashed line in Figure III-7).



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Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Figure III-8
Foster City Levee Protection Planning and Improvements Project EIR
Conventional Floodwall Levee Improvement Type

3. Construction Activity Associated with Each Levee Improvement Type

Construction activities include: (1) sheet pile placement and/or wall construction; (2) fill placement and Bay Trail reconstruction; and (3) wall aesthetic enhancement and landscaping. These activities would overlap during different phases of construction. Sheet pile placement and/or wall construction would involve levee excavation and installation of a temporary sheet pile on the water side. Fill placement and Bay Trail reconstruction would primarily involve fill placement and grading followed by paving. Wall aesthetic enhancement and landscaping would include replacement and new landscaping in addition to aesthetic treatments of the floodwalls (if so designed).

Construction is anticipated to begin in 2018 and would involve two construction crews working 5-day work weeks under both scenarios. The estimated timeframes for each activity are presented in Table III-3.

TABLE III-3 PROPOSED CONSTRUCTION ACTIVITY SCHEDULE

Construction Activity	2050 Sea Level Rise Scenario Estimated Time	2100 Sea Level Rise Scenario Estimated Time
Sheet Pile Placement/Wall Construction	230 days	290 days
Levee Fill and Trail Reconstruct	180 days	285 days
Landscaping/Wall Enhancement	105 days	200 days

Source: Information based on written communication between Schaaf & Wheeler and Urban Planning Partners, 2016.

a. Emergency Access

The Safety Element of the Foster City General Plan designates two minor evacuation routes (those that allow use by pedestrians and bicyclists) including: (1) the portion of the Bay Trail that leads to the city of Belmont (also a designated fire access road), and (2) the Bay Trail under the San Mateo Bridge/SR 92 to East 3rd Avenue.

The Foster City Fire Department requires emergency access for heavy equipment including an engine, from East 3rd Avenue to the beach near Baywinds Park for water rescue[8]. This emergency access lane, which is approximately 25 feet wide, will remain intact after construction. The line of flood protection must cross over this access lane, and this will be accomplished either with a flood break structure suitable for the weight of the equipment,

[8] Hegwer, Gary, 2016. Deputy Fire Chief, Foster City, California. Personal Communication with Marlene Subhashini, Foster City Senior Planner. August 29.

or by grading ramps to the flood protection elevation, with a maximum slope of 8 percent and vertical curves suitable for equipment passage.

During the construction of adjacent floodwalls and the grading necessary for flood protection, a free lane for equipment passage with a minimum width of 12 feet will be maintained at all times. It is also noted that the Lakeside Drive extension from East 3rd Avenue to the Baywinds Park parking lot will not be disrupted during construction and will remain unchanged after construction.

The Foster City Fire Department also requires crews to access open space located on the bayside of the levee and trail, from roughly Foster City Boulevard to Tarpon Street as required to fight wildfire. Based on conversations with the Deputy Fire Chief, with a maximum wall height relative to the trail of 3.5 feet, firefighting activities can be accomplished by carrying fire hoses across the floodwall on foot. Engines would draw water from fire hydrants positioned on the opposite side of Beach Park Boulevard, as is now the case. During construction, the contractor will be explicitly instructed to conduct their operations so as not to interfere with emergency activities within the work area.

Emergency egress is provided from the Bay Trail in Foster City to the Belmont Slough Trail in Redwood City near the Baffin Street cul-de-sac. Depending upon the flood protection elevation selected, this emergency egress will be maintained after construction through raised grades, conforming to ADA requirements (maximum slope of 5 percent) or a flood break type structure capable of handling the weight of a fire engine. Pavement for this egress path will be designed for the weight of the equipment, as is ostensibly the case now.

Grading during construction will proceed to maintain a minimum 12-foot-wide path that can be safely traveled at all times during an emergency.

One example of a flood break structure is a passive automatic flood barrier. The flood barrier would be installed at the access point from the modified levee to the Bay Trail/fire access road to Belmont and one on either side of the San Mateo Bridge/SR 92. A third flood barrier could be installed at a similar emergency egress/fire access road near Lakeside Drive at East 3rd Avenue, and a fourth flood barrier could be installed at the access point from the modified levee to the O'Neill Slough Trail, which connects to Belmont. These flood barriers deploy automatically, lifted by the power of rising floodwaters, to protect the design elevation.[9] They do not require human intervention or power to deploy. Figure III-9 shows the proposed locations of the automatic flood barriers and Figure III-10 provides an example of the conceptual automatic flood barriers' design.

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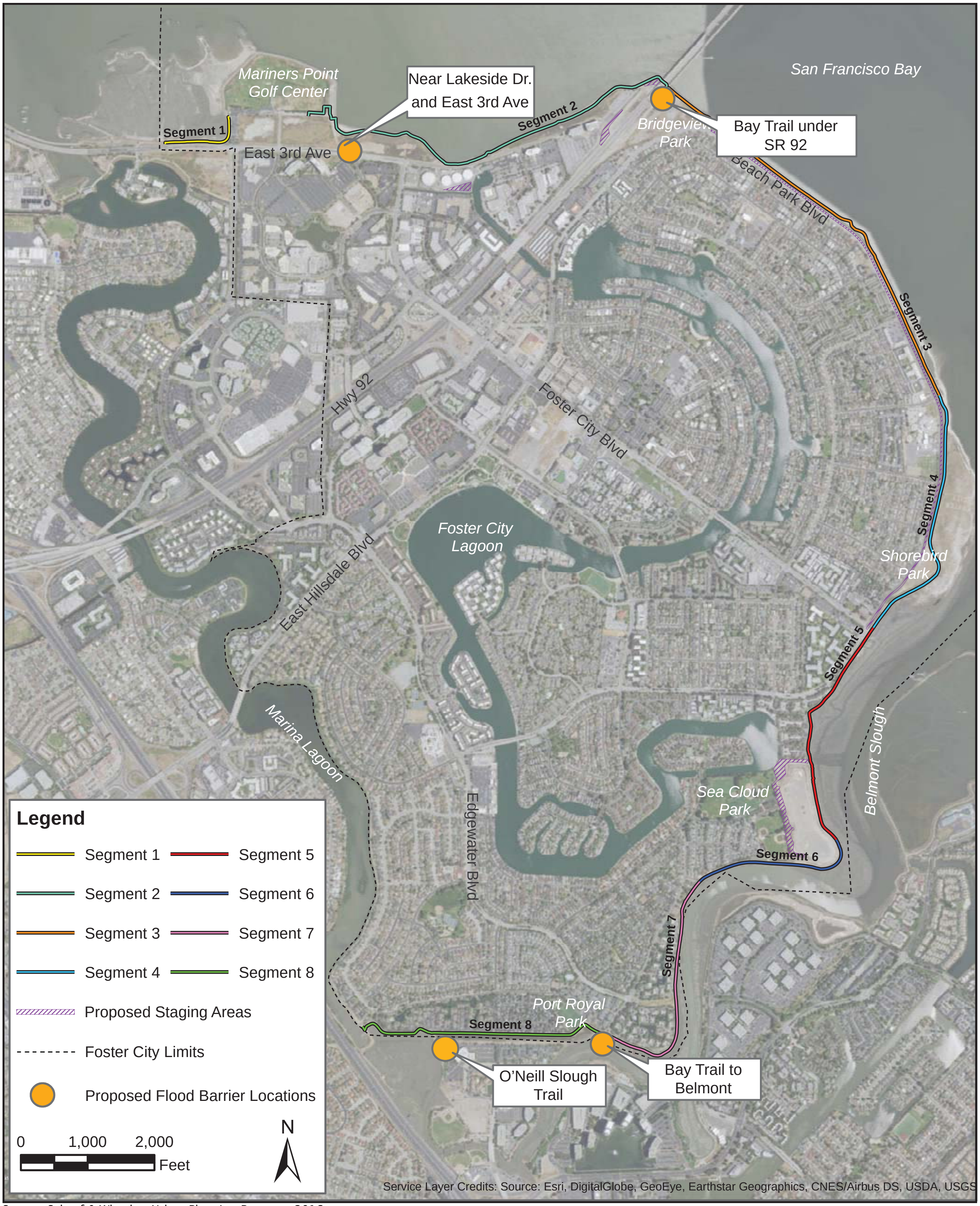
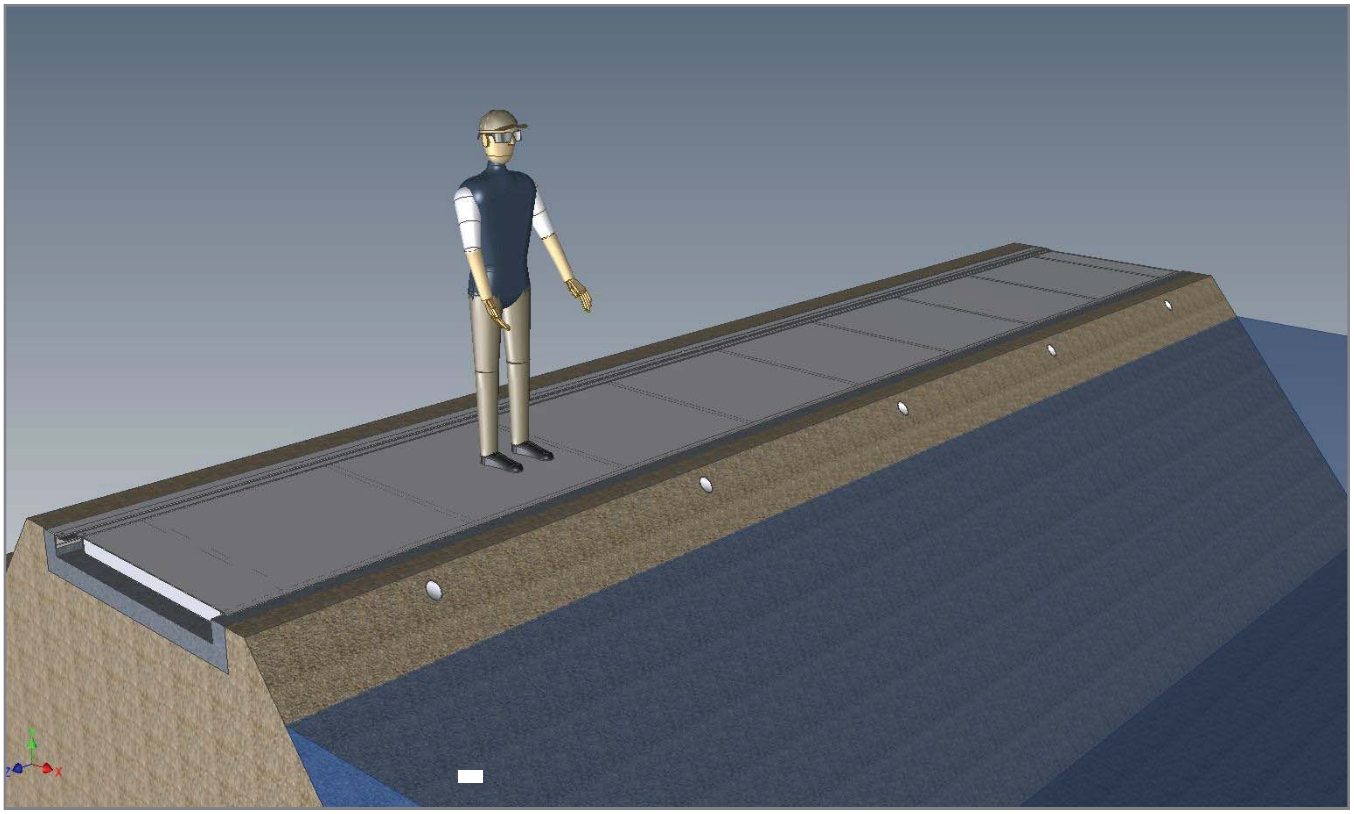
[9] FloodBreak, 2016. Levee Solutions. http://floodbreak.com/projects/levee-solutions/, accessed June 21.

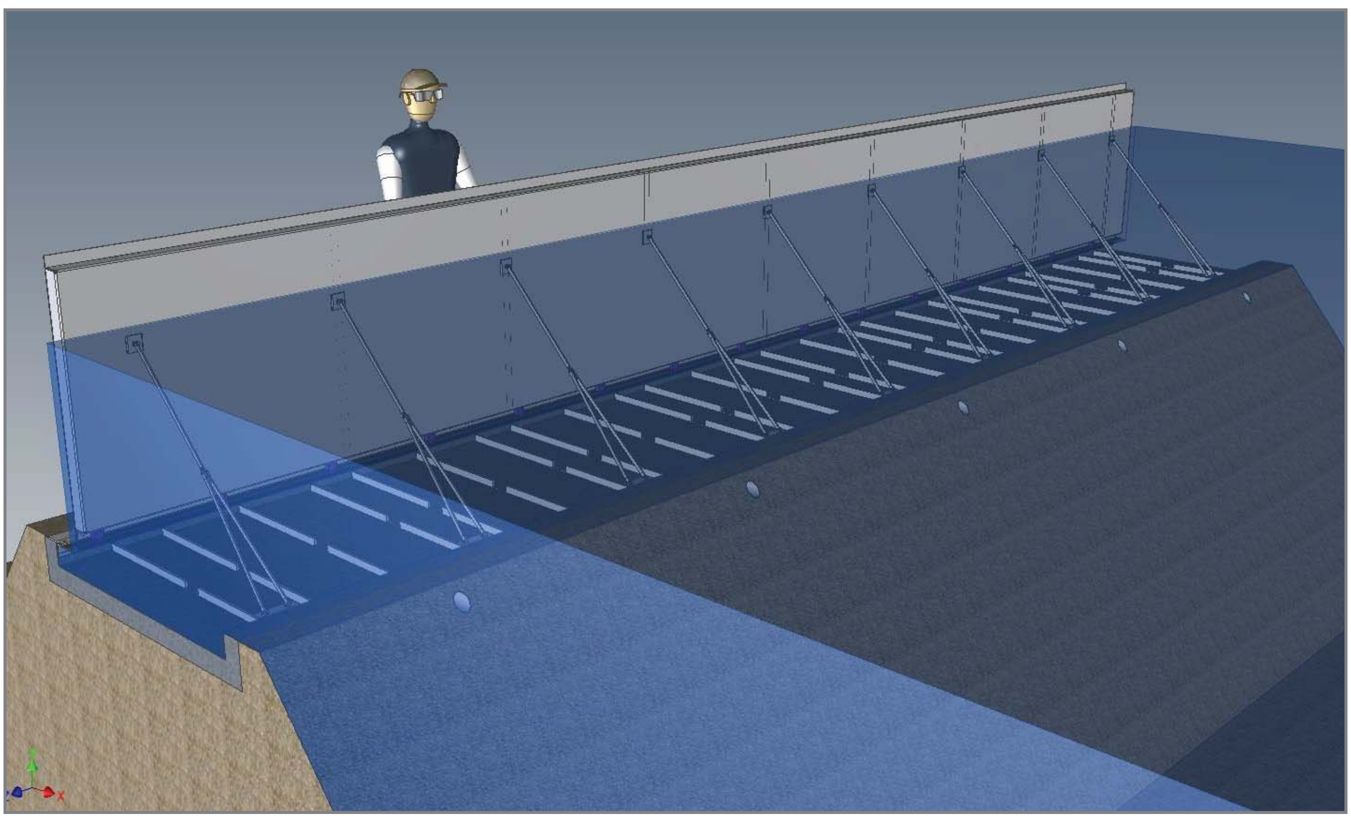


Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-9
Foster City Levee Protection Planning and Improvements Project EIR
Proposed Flood Barrier Locations





Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Figure III-10
Foster City Levee Protection Planning and Improvements Project EIR
Conceptual FloodBreak Design

b. Construction Activity 1: Sheet Pile Placement and/or Wall Construction

For areas with the conventional floodwalls, activities would include levee excavation and installation of a temporary sheet pile on the water side. The temporary sheet pile would potentially be needed beneath the San Mateo Bridge and along the O'Neill Slough Remnant Channel from west of Port Royal Park to the end of the levee, as these are the only areas designated for conventional floodwalls under both the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios. Temporary sheet pile walls or other temporary flood barriers would not be removed until the permanent installation is completed to its finished elevation. Permanent sheet pile would be installed for all other areas of the floodwall improvement type. In areas designated for earthen levees, the top of the existing levee would be excavated and conditioned to accept new fill. In areas where there are existing walls, sheet piles would be driven in front (if sufficient room exists outside of wetlands). Afterward, the existing walls would be demolished. A total of six proposed construction staging areas adjacent to the levee system could be used, as shown in Figure III-11. All work would be conducted from the landward side and no existing riprap bank protection would be affected.

(1) Schedule and Employees[10]

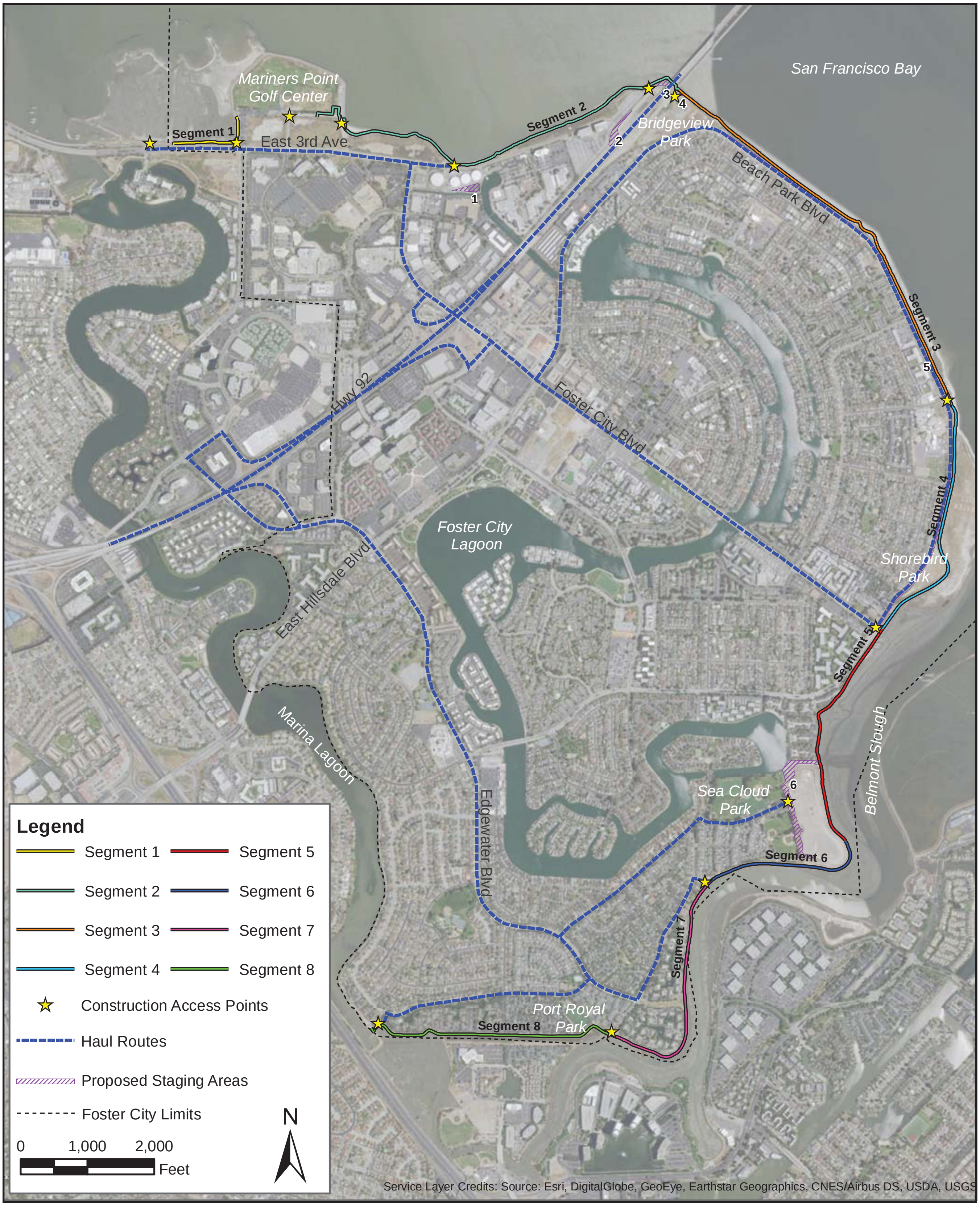
A 1.5–2-year work schedule is anticipated to complete the 2050 Sea Level Rise scenario with a 5-day work week and approximately 19 workers. A period of 2–2.5 years is anticipated to complete the 2100 Sea Level Rise scenario with a 5-day work week and approximately 19 workers. Note that the crews are the same for both schedules, as there are limited areas for construction activities occurring at one time. However, the 2100 Sea Level Rise scenario is estimated to take the crew more time, as there would be a higher volume of fill placement. In accordance with City standard conditions, construction activities would be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays unless deviations from this schedule were approved in advance by the City. The project would require an exception approved by the City Council for construction activities to take place on Saturdays.

(2) Construction Equipment and Vehicle Trips

Construction equipment would include two excavators, two cranes, two generators, percussive hammers, vibratory hammers or a press-type pile driving system, two rubber-tired dozers, two rubber tired loaders, and a flatbed truck.

Vehicle trips would include: (1) workers coming to and from work in cars and light trucks; and (2) delivery of equipment and supplies. Table III-4 provides a summary of estimated vehicle trips for the 2100 Sea Level Rise Scenario associated with Construction Activity 1.

[10] The number of construction workers includes delivery truck drivers. The number of workers would vary depending on work required by the design.



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-11
Foster City Levee Protection Planning and Improvements Project EIR
Truck Haul Routes and Proposed Staging Areas

TABLE III-4 2100 SEA LEVEL RISE SCENARIO ON-ROAD VEHICLE TRIPS FOR SHEET PILE PLACEMENT AND/OR WALL CONSTRUCTION

Vehicle	Construction Activity	Quantity	Round Trips/Vehicle
Worker Vehicle	Sheet Piling/Wall Construction	8	310
Vendor 20-ton truck	Sheet Piling/Wall Construction	4	245

Source: Information based on written communication between Schaaf & Wheeler, Fehr & Peers, and BASELINE Environmental Consulting, 2016.

Heavy trucks would be required to leave the project site no later than 4 p.m. in order to avoid contributing to existing congestion during afternoon commute hours.

a. Construction Activity 2: Fill Placement and Trail Reconstruction

In areas designated for the conventional and sheet pile floodwall improvement types, the trail would be raised with additional fill in locations where the finished floodwall elevation is higher than 3.5 feet above the trail. Activities would include fill placement and grading followed by paving. The amount of fill for each of the scenarios is shown in Table III-5. The source of the fill could include both conventional fill (from a local source) and lightweight levee fill (most likely transported from Susanville, California). Staging areas would be used for: (1) temporary stockpiling of fill, so that fill materials do not require transport from their source(s) directly to the work site; (2) construction equipment storage; (3) sheet pile storage and transfer to construction equipment; (4) miscellaneous material storage; (5) parking for workers; and (6) other indirect construction-related activities. The Bay Trail would be replaced in-kind or improved; the new trail would be 14-16 feet wide (10 feet paved with a 2-foot shoulder on each side and an additional 1 foot of shoulder adjacent to vertical walls where feasible). The Bay Trail's paved pathway is currently 8 feet wide.

TABLE III-5 LEVEE FILL VOLUME RANGE

Scenario	Approximate Fill Volume Range (in cubic yards)
2050 Sea Level Rise	34,000–46,000
2100 Sea Level Rise	150,000–162,000

Source: Information based on written communication between Schaaf & Wheeler and Urban Planning Partners, 2016.

(1) Schedule and Employees[11]

The 1.5–2-year work schedule to complete the 2050 Sea Level Rise scenario would consist of a 5-day work week with six workers for fill and grading activities and 12 workers for paving activities. The 2–2.5-year work schedule to complete the 2100 Sea Level Rise scenario would consist of the same 5-day work week with six workers for fill and grading activities and 12 workers for paving activities, but would require additional time to complete the project due to the increased amount of fill placement. Daily construction schedules would be the same as those described for Construction Activity 1.

(2) Construction Equipment and Vehicle Trips

The equipment to complete the 2050 Sea Level Rise scenario would include a grader, a rubber tired dozer, a rubber tired loader, a water truck, a tandem roller, a pneumatic roller, a sheepsfoot roller, a paver, a truck tractor, three 10-ton dump trucks, and three 20-ton dump trucks. Trucks would be required to leave the project site no later than 4:00 p.m. in order to avoid contributing to existing congestion during afternoon commute hours.

The 2100 Sea Level Rise scenario would involve two grading crews, and the equipment would therefore include two graders, two rubber tired dozers, two rubber tired loaders, two water trucks, two tandem rollers, two pneumatic rollers, two sheepsfoot rollers, a paver, a truck tractor, three 10-ton dump trucks, and three 20-ton dump trucks.

Vehicle trips would include: (1) workers coming to and from work in cars and light trucks; and (2) delivery of equipment and supplies. Table III-6 provides a summary of estimated vehicle trips for the 2100 Sea Level Rise Scenario associated with Construction Activity 2.

TABLE III-6 2100 SEA LEVEL RISE SCENARIO ON-ROAD VEHICLE TRIPS FILL PLACEMENT AND TRAIL RECONSTRUCTION

Vehicle	Construction Activity	Quantity	Round Trips/Vehicle
Worker Vehicle	Levee Fill and Trail Reconstruct	12	300
Hauler 20-ton truck	Levee Fill and Trail Reconstruct	6	2,042

Source: Information based on written communication between Schaaf & Wheeler, Fehr & Peers, and BASELINE Environmental Consulting, 2016.

[11] Information based on written communication between Schaaf & Wheeler and Urban Planning Partners, 2016.

c. Construction Activity 3: Wall Aesthetic Enhancement and Landscaping

This phase would include replacement and new landscaping in addition to aesthetic treatments of the floodwalls (if so designed).

(1) Schedule and Employees[12]

Both the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario would consist of a 5-day work week with 12 workers for landscaping activities and three workers for hydroseeding. Daily construction schedules would be the same as those described for Construction Activity 1.

(2) Construction Equipment and Vehicle Trips

The equipment for the 2050 Sea Level Rise scenario and 2100 Sea Level Rise scenario would include three skid steers, a hydro-mulcher, and a truck tractor. Heavy trucks would be required to leave the project site no later than 4:00 p.m. in order to avoid contributing to existing congestion during afternoon commute hours. Vehicle trips would include: (1) workers coming to and from work in cars and light trucks; and (2) delivery of equipment and supplies. Table III-7 provides a summary of estimated vehicle trips for the 2100 Sea Level Rise Scenario associated with Construction Activity 3.

TABLE III-7 2100 SEA LEVEL RISE SCENARIO ON-ROAD VEHICLE TRIPS WALL AESTHETIC ENHANCEMENT AND LANDSCAPING

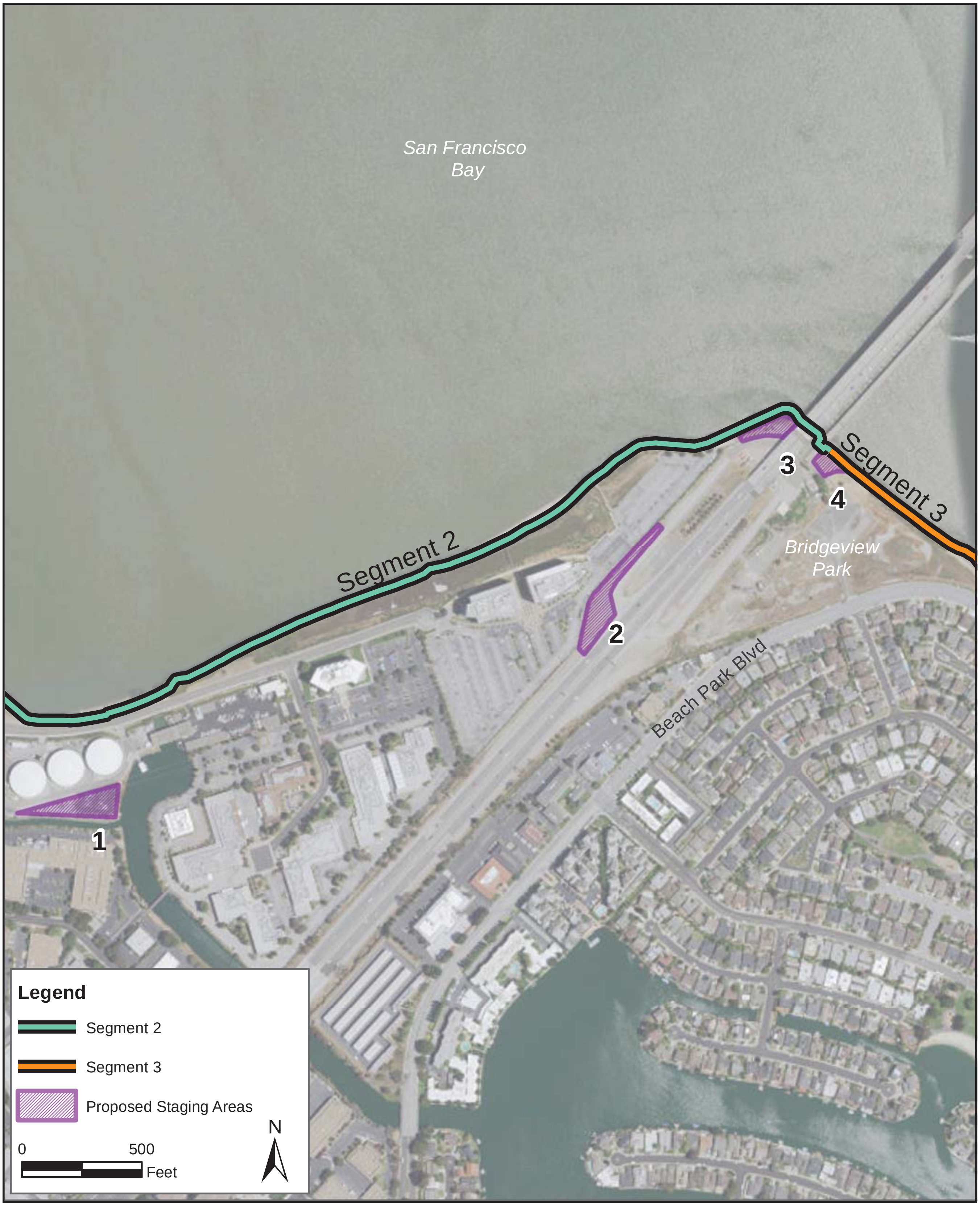
Vehicle	Construction Activity	Quantity	Round Trips/Vehicle
Worker Vehicle	Landscaping	6	210

Source: Information based on written communication between Schaaf & Wheeler, Fehr & Peers, and BASELINE Environmental Consulting, 2016.

4. Staging Areas

Six staging areas along the levee are proposed for the contractor to access the project site. As shown in Figure III-12, the first staging area is located in the City's Corporation Yard in a 0.6-acre parking lot behind three water towers, just southeast of the intersection of East 3rd Avenue and Foster City Boulevard. Three additional staging areas – two, three, and five – are proposed near the base of the San Mateo Bridge, as shown in Figure III-12: (2) a 0.8-acre staging area in a dirt lot to the west of CA 92, approximately 0.2 mile southwest of the San Mateo Bridge; (3) a 0.3-acre staging area west of the bridge in a dirt lot; and (4) a 0.2-acre staging area to the east of the bridge in a dirt area with picnic

[12] Information based on written communication between Schaaf & Wheeler and Urban Planning Partners, 2016.



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-12
Foster City Levee Protection Planning and Improvements Project EIR
Staging Areas to the North

benches. As shown in Figure III-13, the fifth staging area is a 5.4-acre linear area is proposed along Beach Park Boulevard from Bridgeview Park for 1.7 miles to the intersection with Foster City Boulevard. The sixth staging area is a 3.8-acre site along the perimeter of the Dredge Disposal Site on the landward side of the levee as shown in Figure III-14, between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough.

5. Schedule/Phasing

Proposed levee improvements would be constructed in phases over 1.5–2 years for the 2050 Sea Level Rise scenario or 2–2.5 years for the 2100 Sea Level Rise scenario. Three major restrictions would be placed on the contractor, as follows:

1. Only select portions of the Bay Trail may be closed simultaneously and no two contiguous (adjacent) segments of the Bay Trail would be closed at one time, as directed by the City.

   Habitat for the endangered Ridgway's rail encompasses all sections of the levee along Belmont Slough from Shorebird Park to O'Neill Slough. Construction shall be avoided along this portion of the levee during the annual nesting season, which is February 1 to August 31. If work along portions of this levee segment becomes necessary during the nesting season, a protocol breeding survey for Ridgway's rail shall be conducted prior to the nesting season to identify the location of all Ridgway's rail nests within the vicinity of the work area. No work will be allowed within 700 feet of a nest (as referenced in *Section V.C, Biological Resources* under Mitigation Measure BIO-1a).

2. NOAA Fisheries/National Marine Fisheries Service has indicated that a work window to protect listed fish species or Essential Fish Habitat would not be necessary as long as the project included the following items (all currently included as part of the project description): (i) sheet piles will be installed in uplands (into the existing levee) using land-based equipment, (ii) sheet piles will be installed using vibratory hammering methods, (iii) there would be no in-water work, (iv) the contractor will use BMPs to control erosion and sedimentation into adjacent waters, and (v) widening of the toe of the slope of the levee, if necessary, would be accomplished on the inboard side of the levee if at all possible.[13]

Recommended Bay Trail detour routes and locations for each phase of construction are presented in Figures III-15 and III-16, for the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, respectively. Note this is subject to change as there are a number of other construction phasing plans that could achieve the restrictions and target schedule.

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[13] Huffman-Broadway Group, Inc. (HBG), 2016c. Personal communication between Gary Deghi of HBG with Gary Stern, Supervising Fish Biologist of NOAA Fisheries/National Marine Fisheries Services. July 13.

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-13
Foster City Levee Protection Planning and Improvements Project EIR
Staging Area to the East

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure III-14
Foster City Levee Protection Planning and Improvements Project EIR
Staging Area to the South

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change. Construction routes lie along levee.

Figure III-15
Foster City Levee Protection Planning and Improvements Project EIR
Constuction Phasing (2050 Sea Level Rise Scenario)

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change. Construction routes lie along levee.

Figure III-16
Foster City Levee Protection Planning and Improvements Project EIR
Constuction Phasing (2100 Sea Level Rise Scenario)

Work is proposed to take place along levee segments that are identified based on work that could be completed by a single major work crew for a fixed duration. Because most of the construction would involve driven sheet pile walls, sheet pile installation is generally performed by the resource-limited work crew. It is expected that, to complete the project within 1.5–2 years under the 2050 Sea Level Rise scenario or 2–2.5 years under the 2100 Sea Level Rise scenario, two vibratory hammers would be operating on the project throughout construction. A particular construction phase is therefore composed of work within two or fewer segments given the likely resource constraint. It is assumed that construction takes place during a 5-day work week with construction activities permitted from 8:00 a.m. to 5:00 p.m. on weekdays. The project would require an exception by the City Council for construction activities to take place on Saturdays.

6. Operation Period

The anticipated operation period for the 2050 Sea Level Rise scenario is 30 years, and the operation period for the 2100 Sea Level Rise scenario is 80 years. One design option is to install a floodwall suitable for the 2100 Sea Level Rise scenario, but with top of levee and floodwall elevations limited to the 2050 Sea Level Rise scenario. For this option, the operation period is also 80 years with additional construction to extend the level of protection anticipated sometime within those 80 years.

Levee and trail maintenance would be similar to current practices. The sheet pile walls, however, would require additional maintenance that includes routine graffiti removal and/or wall recoating, routine guard rail cleaning and periodic repair, and occasionally monitoring of the rate of loss of sheet pile material due to corrosion.

E. AGENCY ACTIONS

1. Discretionary Approvals

This EIR is expected to provide the environmental review for all discretionary approvals and actions required for the project. A number of permits and approvals would be required before project development could be initiated. As Lead Agency for the project, the City of Foster City would be responsible for the environmental review. Other Responsible Agencies would have authority related to the project and its approvals. A list of permits and approvals that may be required by the City and other agencies, without limitations, is provided in Table III-8. Key discretionary actions required by the City of Foster City and regulatory agencies are outlined below.

a. City Approvals

This Draft EIR, together with the written responses to comments received on the Draft EIR during the 45-day public review period, will constitute the Final EIR. Once complete, the

TABLE III-8 REQUIRED PERMITS AND APPROVALS

Lead Agency	Permit/Approval
City of Foster City	• Environmental Review • Funding and design approval • Contract approval for construction • Grading/Building Permits
Responsible Agencies – State	
Caltrans	• Encroachment Permit[14]
San Francisco Bay Regional Water Quality Control Board	• Clean Water Act State 401 Water Quality Certification • Porter Cologne Act Waste Discharge Permit
San Francisco Bay Conservation and Development and Commission	• Development Permit • Coastal Zone Management Act Consistency Determination
State Lands Commission	• Lease Agreement
Responsible Agencies - Federal	
U.S. Army Corps of Engineers	• Clean Water Act Section 404 Permit • Section 10 Rivers and Harbors Act Permits. • U.S. Fish and Wildlife Service Endangered Species Act Section 7 consultation • NOAA Fisheries Endangered Species Act Section 7 consultation and Essential Fish Habitat consultation. • State Historic Preservation Office National Historic Preservation Act Section 106 evaluation. • Native American Heritage Commission consultation
Federal Emergency Management Agency	• Letter of Map Revision

Source: Huffman Broadway Group, Schaaf & Wheeler, and Urban Planning Partners, 2016.

Final EIR will be presented to the Planning Commission and City Council. If they find that the Final EIR provides a complete analysis consistent with the requirements of the California Environmental Quality Act (CEQA), the City will certify the Final EIR. Certification of the EIR will meet the requirement for environmental review under CEQA. Additional City approvals include funding and design approval, contract approval for construction, and grading and building permits.

[14] For proposed staging areas 3 and 4 at the base of the San Mateo Bridge/SR 92. Other permits would be obtained if necessary.

b. State Approvals

(1) Encroachment Permit

An encroachment permit must be obtained for all proposed activities related to the placement of encroachments within, under, or over the State highway rights of way. Examples of work requiring an encroachment permit are: utilities, excavations, encroachment renewals, and vegetation planting or trimming.

(2) Clean Water Act Section 401 Water Quality Certification

Under Section 401 of the Clean Water Act, a State 401 Water Quality Certification must be obtained from the San Francisco Bay Regional Water Quality Control Board (RWQCB) because the project could result in a discharge of fill material into waters of the U.S. and State. The certification will specify that the project complies with State water quality standards.

(3) Porter-Cologne Act Waste Discharge Permit

Under the Porter-Cologne Water Quality Control Act, the San Francisco Bay RWQCB regulates the "discharge of waste," which includes fill material placed into "waters of the state," including San Francisco Bay. The issued waste discharge permit will provide waste discharge requirements to be followed during project construction.

(4) San Francisco Bay Conservation and Development Commission Development Permit

A San Francisco Bay Conservation and Development Commission (BCDC) Development Permit is required before work (including filling, dredging, dredged sediment disposal, and shoreline development) is undertaken in the bay or within BCDC's 100-foot shoreline band jurisdiction.

(5) Coastal Zone Management Act Federal Consistency Certification

Under the provisions of the Coastal Zone Management Act (CZMA), a federal agency must conduct its activities in a manner consistent, to the maximum extent practicable, with the enforceable policies of the State of California's certified coastal management program, which is the San Francisco Bay Plan for the project. The project requires federal permits under Clean Water Act (CWA) Section 404 and Section 10 of the Rivers and Harbors Act. Before these authorizations are issued, the project must receive a CZMA consistency determination from BCDC.

(6) State Lands Commission Lease Agreement

The project would require a lease agreement to construct structures on lands under the jurisdiction of the State Lands Commission, which include diked and filled baylands, tidelands, and submerged lands.

c. Federal Approvals

(1) Clean Water Act Section 404 Permit

The project requires federal permits from USACE under CWA Section 404 because the project has the potential to discharge dredge or fill material into Waters of the United States. The 404 Permit can either be an individual permit or a general permit, which can be issued on a nationwide, statewide, or regional basis.

(2) Section 10 of the Rivers and Harbors Act Permit

The project requires federal permits from USACE under Section 10 of the Rivers and Harbors Act 1899 because the project involves construction of a structure and/or work in, under, or over any navigable water of the United States.

(3) U.S. Fish and Wildlife Service Endangered Species Act Section 7 Consultation

Under Section 7 of the Endangered Species Act, federal agencies must consult with the U.S. Fish and Wildlife Service when any action the agency carries out, funds, or authorizes (such as through a permit) may affect a listed endangered or threatened species. This process usually begins as informal consultation. A federal agency, in the early stages of project planning, approaches the U.S Fish and Wildlife Service and requests informal consultation. Discussions between the two agencies may include what types of listed species may occur in the proposed action area, and what effect the proposed action may have on those species.[15]

(4) NOAA Fisheries Endangered Species Act Section 7 Consultation and Essential Fish Habitat Consultation

Under Section 7(a)(2) of the Endangered Species Act, federal agencies are required to consult with National Marine Fisheries Service (NOAA Fisheries) on activities that may affect an endangered or threatened species. The federal agency shall ensure that its action is not likely to jeopardize the continued existence of such species or result in the destruction or adverse modification of critical habitat of such species. In addition, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, the federal agency must determine if its action will adversely affect Essential Fish Habitat, and consult with NOAA Fisheries if the action would adversely affect Essential Fish Habitat.[16]

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[15] United States Fish & Wildlife Services, 2016. Section 7 Consultation, updated February 25, 2016. https://www.fws.gov/Midwest/Endangered/section7/section7.html, accessed on August 12.

[16] National Oceanic and Atmospheric Administration (NOAA), 2016. Consultations to Protect Essential Fish Habitat. http://www.habitat.noaa.gov/protection/efh/consultations.html, accessed on August 12.

(5) State Historic Preservation Office National Historic Preservation Act Section 106 Evaluation

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to ascertain whether an undertaking that requires a federal permit or approval would have an effect on historic properties. If historic properties are affected, the federal agency shall determine whether the effect is adverse; i.e., the undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register of Historic Places in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. As part of the process, the federal agency shall consult the appropriate State Historic Preservation Officer.[17]

(6) Native American Heritage Commission Consultation

In addition, Section 101(d)(6)(B) of the NHPA requires the lead agency to consult with any Indian tribe that attaches religious and cultural significance to historic properties that may be affected by an undertaking.

(7) Letter of Map Revision

Upon completion of the detailed design of the levee improvements, the City would submit a Conditional Letter of Map Revision (CLOMR) application to FEMA. A CLOMR is FEMA's mechanism to comment on a proposed project that would, upon construction, affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective base flood elevations, or the Special Flood Hazard Area. The CLOMR indicates whether the project, if built as proposed, would be recognized by FEMA. After FEMA issues the CLOMR, construction of the project would begin.

Upon completion of construction, the City would submit an application for a Letter of Map Revision (LOMR) from FEMA. A LOMR is FEMA's modification to an effective FIRM, or Flood Boundary and Floodway Map, or both. LOMRs are generally based on the implementation of physical measures that affect the hydrologic or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway, the effective base flood elevations, or the Special Flood Hazard Area. A LOMR officially revises the FIRM or Flood Boundary and Floodway Map, and sometimes the Flood Insurance Study report, and when appropriate, includes a description of the modifications. Once a complete LOMR application is submitted, FEMA has 90 days to review the application and issue the LOMR, or request additional data, or request additional review time.

[17] Advisory Council of Historic Preservation (ACHP), 2016. Section 106 Regulations Summary. http://www.achp.gov/106summary.html, accessed on June 2.

IV. PLANNING POLICY

This chapter discusses the relationship of the proposed Foster City Levee Protection Planning and Improvements Project ("the project") to applicable planning-related policies, including land use policies. This discussion, while not required under the California Environmental Quality Act (CEQA), is being provided for informational purposes to contextualize the project within current policies and plans.[1] It is important to understand that the determination of whether a project is consistent with a specific policy can be subjective and it is not the purpose of this Environmental Impact Report (EIR) to interpret policy. Rather, the analysis in this chapter represents the policy review findings by the EIR author (including a list of the goals and policies relevant to the project and site) and is intended to provide the City of Foster City (City)'s local decision-makers (e.g., Planning Commission or City Council) with a guide for policy interpretation.

The main guiding documents regulating land use within and around the project site include the following:

- Foster City General Plan (particularly the Land Use and Circulation Element)
- Foster City Zoning Ordinance
- San Francisco Bay Plan (Bay Plan)
- San Mateo County Comprehensive Airport Land Use Plan
- Plan Bay Area

Consistency of the proposed project with other environmental-related policies is addressed in the appropriate topical sections of the EIR (e.g., Air Quality). Applicable planning policies from each of the documents listed above are described in the following subsections of this chapter.

A. FOSTER CITY GENERAL PLAN

This subsection describes the Foster City General Plan (General Plan) and discusses the proposed project's relationship to applicable goals, policies, and programs outlined in the General Plan. Applicable planning-related policies in the General Plan and the relationship

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[1] As outlined in the CEQA Environmental Checklist, Appendix G, the project's inconsistency with a policy is only considered significant if (i) such policy was adopted for the purpose of avoiding or mitigating an environmental effect; and (ii) such inconsistency would cause *physical* environmental impacts. Applicable policies are discussed in select topical sections of the EIR where they relate to physical elements and are intended to avoid or mitigate an environmental effect.

of the proposed project with these policies are summarized in Table IV-1 located at the end of this chapter.

The General Plan is a comprehensive plan for the growth, development, and conservation of the city. The General Plan includes policies related to land use and circulation, housing, parks and open space, conservation, and noise and safety. These topics are addressed within individual elements of the General Plan.

1. Land Use and Circulation Element

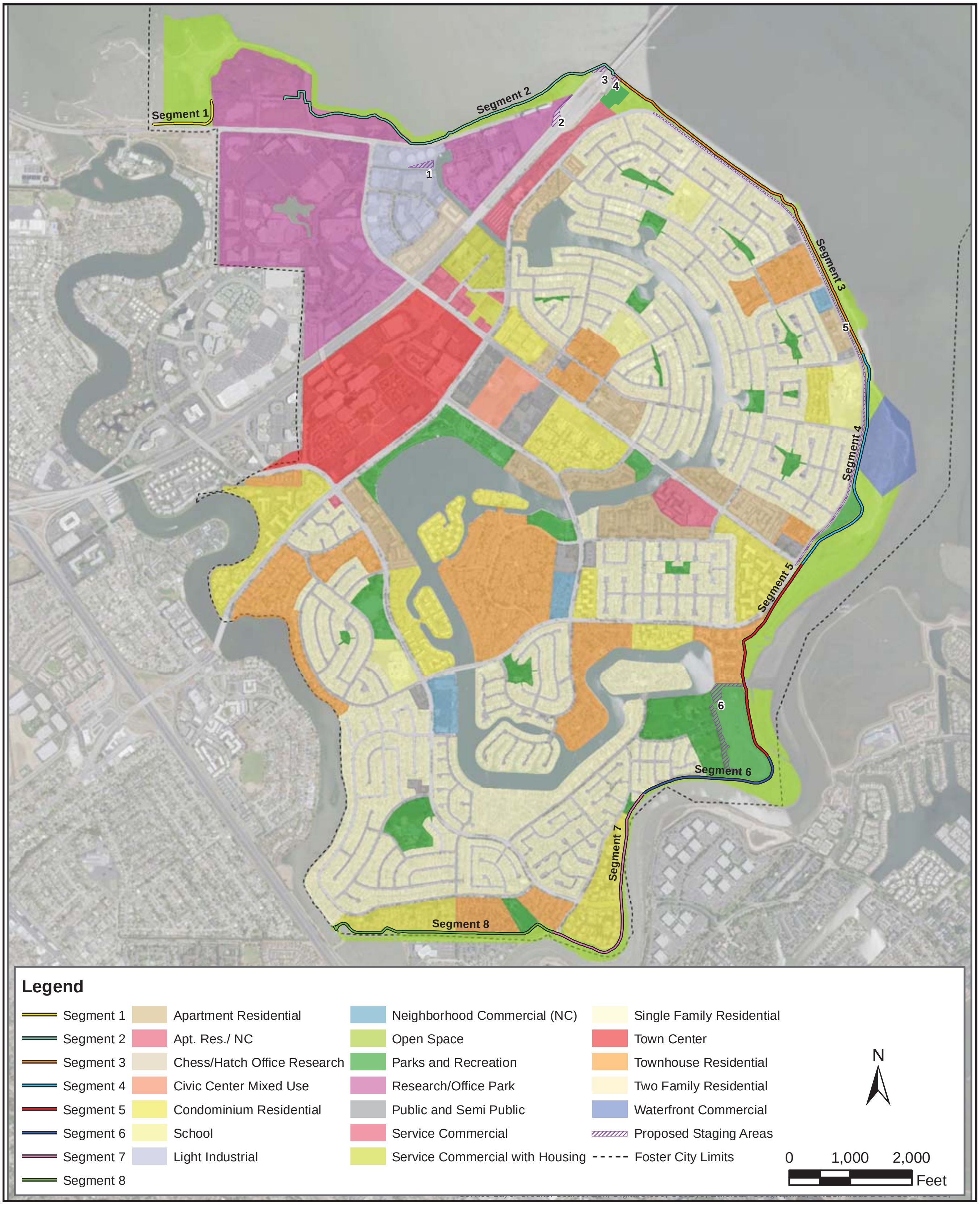
a. Overview

The Land Use and Circulation Element establishes a pattern for land use and sets clear standards for the density of population and the intensity of development for proposed land uses. The element establishes a direct link between the timing, amount, type, and location of development with the traffic, service, and infrastructure demands generated by development. The overall vision of the Land Use and Circulation Element is to "maintain the integrity and high quality living environment of the City's residential neighborhoods; achieve a successful buildout that balances jobs and housing, infrastructure capacity with development needs; and respond to longer-term land use and circulation needs in an appropriate manner."

The General Plan land use classifications for the project site, including staging areas, as established by the Land Use and Circulation Element of the City's General Plan,[2] are Open Space, Parks and Recreation, Light Industrial, Waterfront Commercial, and Research/Office Park. As depicted in Figure IV-1, the existing levee is designated as Open Space and Waterfront Commercial. The staging areas are located in areas designated as Parks and Recreation, Open Space, Light Industrial, and Research/Office Park.

Areas designated as Open Space are typically vacant of structures and improvements. They are primarily maintained in their natural condition. In some cases, maintained pathways or parking areas that enhance public access to open space areas are considered compatible with the open space designation. Areas designated as Parks and Recreation typically are used for improved open space lands for which the primary purpose is recreation; they include local and regional parks. Areas designated as Light Industrial include wholesale facilities, storage warehouses, and the manufacturing, processing, repairing, or packaging of goods. Areas designated as Waterfront Commercial are only for commercial development that is directly related to, and enhances the public use of, the waterfront without damaging environmental effects. Areas designated Research/Office

[2] City of Foster City, 2016. *General Plan, Chapter 3: Land Use and Circulation Element Update.* Adopted February 1.



Source: Foster City, Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure IV-1
Foster City Levee Protection Planning and Improvements Project EIR
General Plan Land Use Designations

Park contain office, research and development, and manufacturing establishments with clean and quiet operations.

b. Relationship to Project

The project consists of improving approximately 43,000 feet (8 miles) of existing levees that surround Foster City along the bayfront with a slight deviation from the existing levee system foot print – starting at Beach Park Boulevard at Swordfish Street and extending to the northern edge of Shorebird Park.

The proposed project is generally consistent with the land use designations, goals, and policies of the General Plan Land Use and Circulation Element, as detailed in Table IV-1 at the end of this chapter.

2. Parks and Open Space Element

a. Overview

The Parks and Open Space Element of the General Plan addresses the preservation of parks and open space. The intent of this element is to provide policies that maintain and improve existing natural resources, parks, and open space within Foster City. The overall vision of this element is to preserve and improve the quality of life within existing neighborhoods; ensure the proper development of undeveloped property; and ensure that redevelopment of developed or underutilized property occurs in an appropriate manner. The Foster City General Plan has a parkland standard of 5 acres per 1,000 residents.

b. Relationship to Project

As discussed in *Chapter III, Project Description,* the levee system that is proposed to be raised also functions as a pedestrian and bicycle path that is part of the San Francisco Bay Trail (Bay Trail). The pedway that is part of the Bay Trail consists of a concrete pathway constructed on top of the levee, encircling almost the entire city and providing public access to San Francisco Bay, Belmont Slough, and the Marina Lagoon. The raised pedway is separated from streets or developments with landscaping and has viewpoints with benches for viewing the waterfront. Due to the separation from the street/motor vehicles, the pedway qualifies as a Class 1 pathway for bicycles and pedestrians.[3] The pedway provides recreational opportunities such as boating, fishing, walking, observation of wildlife and biking. Several policies in the Parks and Open Space Element pertain to the Bay Trail.

[3] City of Foster City. 2009. *General Plan, Chapter 5, Parks and Open Space Element*. Adopted September 9.

Segments of the Bay Trail would need to be closed for construction; however, at least part of the trail would be open at all times. For information on Bay Trail detour routes, refer to *Chapter III, Project Description*, Figures III-15 and III-16. In addition, the Bay Trail would be replaced in-kind or better following construction. Improvements would include observation points, trash cans, benches/seating, and improved access points meeting Americans with Disabilities Act (ADA) requirements[4]. Therefore, the Bay Trail would be improved at the conclusion of the project, and the project would be generally consistent with the goals and policies of the Parks and Open Space Element, as detailed in Table IV-1 at the end of this chapter.

3. Noise Element

a. Overview

The Noise Element of the General Plan identifies and appraises noise issues in the community as a basis for the goals, policies, and implementing actions necessary to maintain conditions desirable and appropriate for Foster City. The overall vision of this element is to preserve and improve the quiet ambience within existing neighborhoods; assure the proper development of undeveloped property; and assure that redevelopment of developed or underutilized property occurs in a manner compatible with existing land uses. To meet these objectives, the Noise Element requires that new development or redevelopment projects be compatible with surrounding land uses. The Noise Element thus establishes land use compatibility standards and suggests ways to reduce noise impacts to adjacent sensitive land uses, such as residences, schools, hospitals, and retirement homes.

b. Relationship to Project

According to the Noise Element of the Foster City General Plan, if the predicted future sound level is greater than 60 A-weighted decibels (dBA) L_{dn} (average noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 p.m. and 7:00 a.m.), a 3-dBA increase in noise due to the project would be considered a significant noise impact[5]. As detailed in *Section V.J, Noise,* the project would result in a temporary increase in noise primarily during construction in three ways: (1) the use of construction equipment on the project site, including in the staging areas; (2) hauling trucks transporting fill materials to the staging areas, and from the staging areas to construction access points; and (3) hauling trucks traveling along the levee to transport

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[4] There are many access points to the Bay Trail that are not official access points. There may not be improvments to ADA standards at these unoffical access points. Additionally, the levee wall will cut off many existing steep ramps down to the beach, which are not presently ADA-compliant. Over-wall access (possibly in the form of steps) to those ramps may be installed, if so these steep access points my not be able to be improved to ADA standards.

[5] City of Foster City, 1993. *General Plan, Chapter 6: Noise Element*. Adopted May.

fill materials from construction access points to the work areas along the levee. Construction activities would consist of the following activities: sheet pile placement and/or wall construction, fill placement and Bay Trail reconstruction, and wall aesthetic enhancement and landscaping. The impact of noise would impact residential receptors varying from 5 to 550 feet away from the project and staging areas. Construction noise generated by the proposed project could generate noise levels that conflict with Foster City Municipal Code regulations temporarily; this impact would conservatively remain significant and unavoidable even after implementation of all feasible mitigation measures. More information on the project's impact on noise can be found in *Section V.J, Noise and Vibration*.

4. Safety Element

a. Overview

The Safety Element of the General Plan focuses on protecting the community from risks associated with earthquakes, floods, fires, toxic waste, crime, and other hazards. It is the means by which Foster City defines measures to reduce these risks to levels determined to be reasonable. The overall vision of this element is to protect the community from the harmful effects of natural hazards; protect the community from harmful effects of Fire and other Urban Hazards; maintain public safety and security in the community; and prepare to respond to emergencies. The Safety Element is divided into several sections: seismic safety and geotechnical hazards, flood hazards, fire/police services and urban hazards, and general safety considerations.

b. Relationship to Project

As discussed in the Safety Element, Foster City's flood protection is provided by a combination of levees along San Francisco Bay and Belmont Slough and the stormwater detention and discharge capabilities of the Foster City Lagoon and the Marina Lagoon. In 2014, the Federal Emergency Management Agency (FEMA) completed the Central and South San Francisco Bay Coastal Flood Hazard Studies associated with the California Coastal Analysis and Mapping Project (CCAMP) addressing hazards associated with tides and waves in San Francisco Bay. The CCAMP studies found that Foster City's levees do not meet the required freeboard elevation for accreditation per federal regulations.[6] By raising the levee, the project would provide sufficient flood protection in accordance with updated FEMA guidelines, as well as to protect against future sea level rise. In doing so, the project would be consistent with Foster City's flood hazard-related policies, as further discussed in Table IV-1.

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[6] Schaaf & Wheeler, 2015a. Foster City Levee Protection Planning Study. February.

The Safety Element of the Foster City General Plan designates two minor evacuation routes (those that allow use by pedestrians and bicyclists) including: (1) the portion of the Bay Trail that leads to the city of Belmont (also a designated fire access road), and (2) the Bay Trail under the San Mateo Bridge/SR 92 to East 3rd Avenue. Construction of the project would restrict access to these two evacuation routes. The fire access road would be closed up to 3 months and the Bay Trail under the San Mateo Bridge/SR 92 would be closed up to 9 months. As part of the project, access to the Bay Trail/fire access road to Belmont and the Bay Trail under the San Mateo Bridge/SR 92 would be restored for emergency response and evacuation purposes.

The Foster City Fire Department requires emergency access to heavy equipment including an engine, from East 3rd Avenue to the beach near Baywinds Park for water rescue. This emergency access lane, which is approximately 25 feet wide, will remain intact after construction. The line of flood protection must cross over this access lane, and this will be accomplished either with a flood break structure suitable for the weight of the equipment, or by grading ramps to the flood protection elevation, with a maximum slope of 8 percent and vertical curves suitable for equipment passage.

During the construction of adjacent floodwalls and the grading necessary for flood protection, a free lane for equipment passage with a minimum width of 12 feet will be maintained at all times. It is also noted that the Lakeside Drive extension from East 3rd Avenue to the Baywinds Park parking lot will not be disrupted during construction and will remain unchanged after construction.

The Foster City Fire Department also requires crews to access open space located on the bayside of the levee and trail, from roughly Foster City Boulevard to Tarpon Street as required to fight wildfire. Based on conversations with the Deputy Fire Chief, with a maximum wall height relative to the trail of 3.5 feet, firefighting activities can be accomplished by carrying fire hoses across the floodwall on foot.[7] Engines would draw water from fire hydrants positioned on the opposite side of Beach Park Boulevard, as is now the case. During construction the contractor will be explicitly instructed to conduct their operations so as not to interfere with emergency activities within the work area.

5. Conservation Element

a. Overview

The Conservation Element of the General Plan addresses the conservation of natural resources in Foster City and institutes programs to conserve natural resources such as the lagoon and canal system. The overall vision of this element is to preserve and improve the

[7] Hegwer, Gary, 2016. Deputy Fire Chief, Foster City, California. Personal Communication with Marlene Subhashini, Foster City Senior Planner. August 29.

quality of life within existing neighborhoods; ensure the proper development of undeveloped property; and ensure that redevelopment of developed or underutilized property occurs in an appropriate manner. Conservation issues discussed in this element are human life-sustaining fundamentals, wildlife habitat, and recycling of renewable resources. Human life-sustaining fundamentals include air, water, and energy. Wildlife habitat refers to areas within the city that provide feeding or resting areas for wildlife such as birds. Recycling of renewable resources includes aluminum cans, glass, paper, newspaper, tin, and some plastic.

b. Relationship to Project

The project site is adjacent to multiple areas of wildlife habitat, including a 57-acre wildlife sanctuary roughly bounded by Tarpon Street on the north, Belmont Slough on the east, Foster City Boulevard on the south, and Beach Park Boulevard on the west. In addition, most of the project site is within the "shoreline band" – i.e., areas 100 feet landward of the line of highest tidal action of San Francisco Bay that are regulated by the Bay Conservation and Development Commission (BCDC), as further described under subsection C., San Francisco Bay Plan. The tidal wetlands and mudflats in this area contain feeding and resting habitat for numerous and diverse migratory shorebirds and some species of waterfowl who migrate along the Pacific flyway. The project site is also home to the harvest mouse, ridgeway rail, and California black rail, which may be impacted by the project. Mitigation measures are recommended to minimize the impact on these special-status animal species by replanting vegetation on the bayside of the sheet piles after project completion. More information on the project's impact on local biological resources can be found in *Section V.C, Biological Resources*.

B. FOSTER CITY ZONING ORDINANCE

This subsection describes the Foster City Zoning Ordinance (Zoning Ordinance) as well as the project's consistency with applicable provisions of the Zoning Ordinance.

1. Overview

The Zoning Ordinance (Title 17 of the Foster City Municipal Code) implements the land use policies of the General Plan and other City plans, policies, and ordinances. It achieves this by dividing the city into zoning districts, each of which is assigned different regulations regarding physical development. These regulations direct the type of allowable uses, as well as building construction, nature, extent, and intensity.

The project site falls within two zoning designations, including:

- Open Space and Conservation District (OSC)
- Open Space and Conservation/Aquatic Development Combining District (OSC/W).

The staging areas fall within four zoning designations, including:

- Open Space and Conservation District (OSC)
- Light Industrial/Planned Development District (M-1/PD)
- Commercial Mix/Planned Development District (C-M/PD)
- Open Space and Conservation/Aquatic Development Combining District (OSC/W).

The OSC zoning designation, established by Chapter 17.34 of the Foster City Municipal Code, is designed to accommodate agricultural crops, wildlife sanctuaries (no structures), open space areas to be preserved from building or set aside for general public use, water-oriented use or boating where land is submerged, and public parks.

The W zoning designation, as established by Chapter 17.40 of the Foster City Municipal Code, is designed to accommodate various types of development and use related to recreational and other types of activities involving the interior lagoon system and the waters of San Francisco Bay, Belmont Cove, and the Marina Lagoon, and other uses or a combination of uses that can be made a part of the planned, orderly, and beneficial use of the water resources of the city in a manner consistent with the General Plan and the recreational element.

C-M/PD, as established by Chapters 17.28 and 17.36 of the Foster City Municipal Code, accommodates a strategic, appropriate mix of commercial uses in a single planned development. The PD District allows for flexibility in the design standards of such developments. According to the code, those standards are to be established, along with development parameters and zoning, by a required General Development Plan/Rezoning and a Specific Development Plan/Use Permit.

The M-1/PD zoning designation, as established by Chapters 17.30 and 17.36 of the Foster City Municipal Code, is designed to accommodate a strategic appropriate mix of commercial and light industrial uses in a single planned development – PD District as described above.

2. Relationship to Project

The existing levee system was constructed prior to construction of the City whose finished ground surface is below the highest tide levels in the San Francisco Bay. The existing levee system provides both tidal flood protection and a unique recreational amenity in Foster City. The Bay Trail includes the levee pedway as part of the regional trail designated around the bay. The project is consistent with the permitted uses in the OSC and OSC/W zoning designations which allow water-oriented uses and uses related to recreational and other types of activities involving the waters of San Francisco Bay. The staging areas located in OSC, OSC/W, C-M/PD and M-1/PD zoning designations are temporary and would return to their pre-existing uses following construction of the project.

C. SAN FRANCISCO BAY PLAN

1. Overview

BCDC consists of 27 members who represent various interests in the bay, including federal, state, regional, and local governments and the public of the San Francisco Bay Region. The Bay Plan implements the Coastal Management Program of BCDC for the San Francisco Bay segment of the California coastal zone. The San Francisco Bay segment includes all areas that are subject to tidal action from the south end of the bay to the Golden Gate and to the Sacramento River line, including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (land lying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide). The Bay Plan was prepared from 1965 through 1969 in accordance with the McAteer-Petris Act (California Government Code Sections 66600-66682), which directs BCDC to exercise its authority to issue or deny permit applications for placing fill, extracting materials, or changing the use of any land, water, or structure within the area of its jurisdiction. BCDC's jurisdiction includes San Francisco Bay (as defined above), a shoreline band of land extending inland for 100 feet from the shoreline of the bay, and certain waterways consisting of all areas that are subject to tidal action on named tributaries that flow into the bay.

To minimize future pressures for bay fill, Bay Plan Maps designate shoreline "Priority Use Areas" that should be reserved for regionally important, water-oriented uses needing or historically located on shoreline sites, such as ports, water-related industry, water-related recreation, airports, and wildlife refuges. The Bay Plan Maps also contain policies that generally specify uses and other criteria for the use and development of each designated site. The project site is shown on Plan Map 6, Central Bay South. The Bay Plan policy for the Foster City site includes providing continuous public access to San Francisco Bay and Belmont Slough, including paths, beaches, and small parks.

2. Relationship to Project

Almost the entire 8-mile project site is located within the jurisdiction of the Bay Plan. The northeast, east, and southeast portions of the project site are designated for the "Wildlife Refuge" and "Waterfront Park/Beach" priority uses by Plan Map 6. The northwest portion of the site is not proposed for any specific use and would be consistent with the Bay Plan policies for other uses of the bay and shoreline. The proposed project would not change the uses at the project site; therefore, the site would remain consistent with its priority use designations. In addition, Plan Map 6 Policy 14 applies: "Foster City – Provide continuous public access to San Francisco Bay and Belmont Slough, including paths, beaches, and small parks." The proposed project would replace the Bay Trail in kind or better after the improvements to the levee, and would therefore be consistent with the above policy. Improvements to the Bay Trail and pedway would include observation points, trash cans, benches/seating, and improved access points meeting ADA requirements.

The following general policies of the Bay Plan would apply to the proposed project:

Plan Map 6 Policy 14: Continuous public access to Bay and Belmont Slough should be provided by the City, including paths, beaches, and small parks.

Public Access Policy 9: Access to and along the waterfront should be provided by walkways, trails, or other appropriate means and connect to the nearest public thoroughfare where convenient parking or public transportation may be available.

Shoreline Protection Policy 1: New shoreline protection projects and the maintenance or reconstruction of existing projects and uses should be authorized if: (a) the project is necessary to provide flood or erosion protection for (i) existing development, use or infrastructure, or (ii) proposed development, use or infrastructure that is consistent with other Bay Plan policies; (b) the type of the protective structure is appropriate for the project site, the uses to be protected, and the erosion and flooding conditions at the site; (c) the project is properly engineered to provide erosion control and flood protection for the expected life of the project based on a 100-year flood event that takes future sea level rise into account; (d) the project is properly designed and constructed to prevent significant impediments to physical and visual public access; and (e) the protection is integrated with current or planned adjacent shoreline protection measures. Professionals knowledgeable of the Commission's concerns, such as civil engineers experienced in coastal processes, should participate in the design.

Shoreline Protection Policy 3: Authorized protective projects should be regularly maintained according to a long-term maintenance program to assure that the shoreline will be protected from tidal erosion and flooding and that the effects of the shoreline protection project on natural resources during the life of the project will be the minimum necessary.

Shoreline Protection Policy 5: Adverse impacts to natural resources and public access from new shoreline protection should be avoided. Where significant impacts cannot be avoided, mitigation or alternative public access should be provided.

The proposed levee improvements would provide flood protection and minimize the risk of levee overtopping, and therefore, would be consistent with *Shoreline Protection Policy 1*. The levee would have an associated maintenance plan, would avoid impacts to natural resources on the bayside of the existing levee, and would avoid impacts to public access, aside from temporary closures of portions of the Bay Trail during construction (detour routes are shown in *Chapter III, Project Description* Figures III-15 and III-16);

therefore, the proposed project would be consistent with *Shoreline Protection Policies 3 and 5,* and *Public Access Policy 9*. The proposed project would also replace the Bay Trail in kind or better after the raising of the levee, and would therefore be consistent with Plan Map 6 Policy 14.

D. SAN MATEO COUNTY COMPREHENSIVE AIRPORT LAND USE PLAN

The project site is located within the vicinity of two airports governed by the San Mateo County Comprehensive Airport Land Use Plan (CLUP). A description of the proposed project's relationship to and consistency with the CLUP is provided below.

1. Overview

California state law requires an airport land use commission to prepare and adopt a CLUP for each public use airport in San Mateo County.[8] The CLUP is a tool used by airport land use commissions to fulfill their purpose of promoting airport/land use compatibility. The purpose of the CLUP is to provide for the orderly growth of each public airport and surrounding area and to safeguard the general welfare of the inhabitants within the vicinity of the airport and the public in general.

The CLUP is focused on the following three major concerns: (1) aircraft noise impact reduction; (2) safety of persons on the ground and in aircraft flight; and (3) height restrictions and airspace protection.[9] The project site is located within the airport influence areas of both the San Francisco International and San Carlos Airports. The Airport Land Use Plans for these two airports, and applicable policies, are discussed below.

a. San Carlos Airport

The project site is located approximately 1.5–4.6 miles from the San Carlos Airport, depending on the levee segment. Most of the project site is located within Area A of the Airport Influence Area (AIA)[10], within which a real estate disclosure notice must be provided to a buyer or lessee of property within the boundary, regarding the proximity of

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[8] California Public Utilities Code Section 21675(a).

[9] City/County Association of Governments of San Mateo County (C/CAG), 1996. San Mateo County Comprehensive Airport Land Use Plan, 1996. Adopted November 14.; City/County Association of Governments of San Mateo County, 2012a, Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport. Adopted October.

[10] City/County Association of Governments of San Mateo County (C/CAG), 2004. CCAG Land Use Committee Recommendation: Revised Airport Influence Area Boundary for San Carlos Aiport – Areas A & B. Adopted October.

the nearby airport[11]. In addition, its southeastern corner is located within the 14 Code of Federal Regulations (CFR) Part 77 Airport Imaginary Surfaces, where maximum heights range from 252 to 352 feet.[12]

Three small segments of the southeast corner of the project site are located inside of the 55-dB community noise equivalent level (CNEL) aircraft noise contour for the San Carlos Airport. This noise contour is used by the Airport Land Use Commission as the threshold for triggering review and evaluation of proposed land use policy actions in proximity to the airport with respect to noise impacts.[13]

Certain types of land uses are recognized by the Airport Land Use Commission as hazards to air navigation in the vicinity of the San Carlos Airport. These land uses include any of the following:

- Any use that would direct a steady or flashing light toward an aircraft engaged in an initial straight climb following takeoff or toward an aircraft engaged in straight final approach toward a landing.
- Any use that would cause sunlight to be reflected toward an aircraft in an initial straight climb following takeoff or toward an aircraft engaged in straight final approach toward a landing.
- Any use that would generate smoke or rising columns of air.
- Any use that would attract large concentrations of birds within approach-climbout areas.
- Any use that would generate electrical interference that may interfere with aircraft communications or aircraft instrumentation.

b. San Francisco International Airport

The project site is located approximately 6.3 to 8.9 miles southeast of San Francisco International Airport. The project site is located within Area A of the AIA, which includes all of San Mateo County, all of which is overflown by aircrafts flying to and from San Francisco International Airport at least once per week at altitudes of 10,000 feet or less above mean sea level.[14] AIA A denotes the Real Estate Disclosure Area, within which the real estate disclosure requirements of state law apply[15].

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[11] To reference the AIA and Area A see the Airport Land Use Comprehensive Plan for San Carlos Airport, pg. 115.

[12] City/County Association of Governments of San Mateo County (C/CAG), 1996, op.cit..

[13] Ibid.

[14] City/County Association of Governments of San Mateo County (C/CAG), 2012a, op.cit.

[15] To reference the AIA and Area A see the Airport Land Use Comprehensive Plan for San Francisco International Airport, pg. 101, Exhibit IV-1.

The northeast and east two-thirds of the project site are also within Area B of the San Francisco International Airport AIA, referred to as the Policy/Project Referral Area. The Airport Land Use Commission has statutory duties to review land use policy actions proposed in Area B. Such actions include General Plan updates and amendments, new Specific Plans, and changes to local zoning ordinances.[16]

Additionally, although the project site is not located within the Federal Aviation Administration's Federal Aviation Regulations Part 77 airspace protection criteria for the airport, most of it is located within the far southeast side of the 14 CFR Part 77 Airport Imaginary Surfaces. The height limit for obstructions permitted within the project site associated with the approach surface ranges from approximately 500 feet to no height limit.[17]

2. Relationship to Project

The northeast and east two-thirds of the project site are partially located inside the mapped height restriction area for San Francisco International Airport, where the maximum height limit ranges from 500 feet to no limit, and the southeastern corner of the project site is located within the mapped height restriction area for San Carlos Airport, where maximum heights range from 252 to 352 feet. The final height of the levee would be no more than 22 feet, well below the height limits of the height restriction areas.

The levee would not create conflicts with design restrictions regarding light or direction of light toward aircraft, nor would any uses generate conflicts with the CLUP. Although the project site is partially located within Area B of the San Francisco Airport AIA and three small segments of the southeast corner of the project site are located inside the 55-dB CNEL aircraft noise contour for the San Carlos Airport, no land use policy actions are proposed; therefore, no Airport Land Use Commission review is required for the proposed project.

E. PLAN BAY AREA

1. Overview

The Association of Bay Area Governments (ABAG) is a volunteer collective of over 100 Bay Area cities and nine Bay Area counties that began in 1961. In 2008, the Sustainable Communities and Climate Protection Act of 2008 Senate Bill 375 (SB 375) was signed into

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[16] City/County Association of Governments of San Mateo County (C/CAG), 2012a, op. cit.

[17] City/County Association of Governments of San Mateo County (C/CAG), 2012b. Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport, adopted October 2012. Exhibit IV-16: 14 CFR Part 77 Airport Imaginary Surfaces – Far Southeast Side.

law by former California Governor Arnold Schwarzenegger and requires 18 California Metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas emissions. On July 18, 2013 the Metropolitan Transportation Commission (MTC) and ABAG Executive Board approved Plan Bay Area, which sets long-range integrated transportation and land-use/housing though 2040 for the San Francisco Bay Area to help meet the requirements of SB 375. Plan Bay Area does this by: providing a strategy for meeting 80 percent of the region's future housing needs in Priority Development Areas (PDAs); providing a transportation element that specifies how some $292 billion in anticipated federal, state and local funds will be spent through 2040; and projecting the region's growth. On July 18, 2013, ABAG and MTC adopted the final EIR for Plan Bay Area, the ABAG Executive Board separately approved the Regional Housing Needs Allocation for 2014 through 2022, and the MTC separately approved the 2013 Transportation Improvement Program.[18]

Plan Bay Area sets a number of targets towards creating sustainable communities. The transportation element includes reducing greenhouse gas emissions from cars and light-duty trucks by 15 percent per capita by 2035, reduces vehicle miles traveled per capita by 10 percent, and boosts the number of trips taken without a car across the Bay Area by 10 percent. It also aims at providing adequate housing for 100 percent of the Bay Area's future workers and residents of all income levels, as well as assigning PDAs for infill[19] projects. Another target includes creating healthy and safe communities by improving air quality, reducing injuries and fatalities from all traffic collisions by 50 percent, and increasing the average amount of time Bay Area residents spend walking and biking for transportation to 15 minutes per day. Plan Bay Area also promotes the preservation of open space and agricultural land. Lastly, Plan Bay Area aims to promote equitable access to housing, jobs, and transportation for all Bay Area residents.[20]

2. Relationship to Project

In addition to PDAs, Plan Bay Area also designates Priority Conservation Areas (PCAs), which aim to protect habitat, recreational and agricultural land in these specific areas. One of the adopted PCAs is the San Francisco Bay Area Water Trail (Water Trail), which is a regional trail along the bay that links nine counties and joins the Bay Trail, Bay Area Ridge trail, and California Coastal Trail. The Water Trail is different from these other trails as it is non-linear and on the water. A portion of the Water Trail lies along the Foster City coast with a launch site at the Baywinds Park on the northern side of the city. The site is listed

[18] Association of Bay Area Governments (ABAG), 2014a. Plan Bay Area. http://planbayarea.org/plan-bay-area.html, accessed August 15, 2016.

[19] Infill projects redidicate land in an urban environment to new construction.

[20] Association of Bay Area Governments (ABAG), 2014b. Goals & Targets. http://planbayarea.org/plan-bay-area/goals-targets.html, accessed August 15, 2016.

as a Regional Recreation site with San Mateo County as the PCA's Lead. Projects located within these areas are eligible for funding through the One Bay Area Grants program.[21,22]

F. OTHER REGIONAL PLANS AND POLICIES

The over-arching policy plans to guide planning in the nine-county Bay Area and the regional planning entities that produced them include the following: the Bay Area 2010 Clean Air Plan, produced by the Bay Area Air Quality Management District (BAAQMD); the Water Quality Control Plan for the San Francisco Bay Basin, produced by the Regional Water Quality Control Board (RWQCB); and Plan Bay Area, the integrated long-range transportation and land use/housing plan produced jointly by MTC and ABAG. The proposed project was reviewed against the BAAQMD's Bay Area 2010 Clean Air Plan and there were no potential conflicts. Physical impacts of the proposed project related to air quality and compliance with these plans are addressed in *Section V.B, Air Quality*. The stormwater discharge, wastewater management, drainage plan, and water quality control systems for the proposed project would comply with the water quality regulations of the San Francisco Basin Plan and would not result in potential conflicts. The physical impacts of implementing these systems and permitting requirements of the RWQCB are discussed in *Section V.H, Hydrology and Water Quality*. The proposed project was reviewed against MTC's and ABAG's Plan Bay Area, and no potential conflicts were found. The physical impacts of the proposed project relating to population and housing are discussed in *Chapter VII, CEQA Required Assessment Conclusions*; and the impacts relating to transportation are discussed in *Section V.K, Traffic and Transportation.*

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[21] San Francisco Bay Area Water Trail, 2016. San Francisco Bay Area Water Trail. http://sfbaywatertrail.org/, accessed August 15.

[22] Association of Bay Area Governments (ABAG), 2015. *Adopted Priority Conservation Areas as of September 2015*. August 15.

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
Land Use and Circulation Element		
Policy LUC-C	*Maintain a Variety of Land Uses*. Maintain land designated for a variety of residential, commercial, light industrial, recreational and public institutional purposes which: (1) provide a mix of housing types, densities and tenure; (2) ensure that a variety of commercial and industrial goods, services and employment opportunities are available in Foster City; (3) offer a range of recreational and public facilities to meet the needs Foster City's residents; and (4) maintain availability of commercial and retail services.	The project would maintain recreational and public facilities to allow for access to the bayfront for current and future residents The project would also improve the Bay Trail, a critical recreational facility in Foster City.
Policy LUC-E	*Provide for Diversified Circulation Needs Develop.* Improve and maintain a circulation system which provides efficient and safe access for private vehicles, commercial vehicles, public transit, emergency vehicles, bicycles and pedestrians.	The project would maintain and improve the existing bicycle and pedestrian infrastructure. See below for details.
Policy LUC-E-8	*Pedestrian, Bicycle and Neighborhood Electric Vehicle (NEV) Friendly Design.* Encourage bicycling, walking and use of NEVs instead of driving automobiles to reduce greenhouse gas emissions, save money on fuel and maintenance, and foster a healthier population. Prioritize pedestrian and bicycle-friendly improvements including bike lanes on main streets, an urban bike-trail system, bike parking, pedestrian crossings, and associated master plans with new or modified development, as appropriate.	The project would maintain and/or improve all pedestrian and bicycle facilities and access points along the levee, which also serves as the Bay Trail within the Foster City jurisdictional boundary. The project would connect to the local neighborhood pedestrian and bicycle network, as appropriate.
Policy LUC-E-9	*Bicycle Routes and Pedestrian Paths.* Maintain a system of bicycle routes and pedestrian paths, which will include separate bicycle lanes and posted bicycle routes. Pedestrian pathways and easements shall be maintained, either by the City, or, in the case of private ownership, according to a maintenance agreement or landscaping district agreement applicable to the pathway/easement.	The project would maintain and/or improve all pedestrian and bicycle facilities and access points along the levee, which also serves as the Bay Trail within the Foster City jurisdictional boundary. Certain segments of the Bay Trail would be temporarily closed during construction; however, only select portions would be closed simultaneously, as directed by the City, to ensure no two contiguous (adjacent) segments would be closed at one time. In addition, Bay Trail detour routes would be provided for trail users. For information on Bay Trail detour routes, refer to *Chapter III, Project Description*, Figures III-15 and III-16

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
Program LUC-E-9-a	*Pedestrian and Bicycle Safety.* Provide safe and convenient access for pedestrians and bicyclists to, across, and along major roadways. The City shall conduct a study of all intersections in the City from a comprehensive perspective which would consider the needs of pedestrians, bicyclists and motorists. The study will include an examination of potential options to address not only current conditions but also conditions anticipated by future development, including enforcement of traffic laws applicable to pedestrians and bicycles. The City will also prepare a study that reviews highly used intersections by pedestrians that are going to Foster City schools and recreational amenities such as the levee and parks and identify ways to increase pedestrian safety at those intersections.	The project would ensure that all safety standards are maintained and/or improved at all intersections used to access the pedestrian and bicycle facilities along the levee.
Program LUC-E-9-b	*Bicycle Route and Pedestrian Path Improvement Program.* The City shall conduct a study with the following goals: 1) identify bike routes that may need enhancements that would increase cyclist safety going to schools, parks, shopping center or civic areas; and 2) identify major thoroughfares and any enhancements to those roadways that would allow cyclists to get to the levee and other common destinations safely. The purpose of the bicycle route system is to connect major work, shopping, school, civic, and recreational destinations throughout the city, while avoiding as many of the most heavily used street segments as possible.	The project would conform to all recommendations for the levee and Bay Trail in the City's Bicycle Route and Pedestrian Path Improvement Program.
Policy LUC-L-5	*Adequate Parks, Pedestrian Pathways and Waterfront Recreation Areas.* The City shall maintain and improve its system of parks, pedestrian pathways, and waterfront recreation areas so that they remain accessible and attractive to residents of the City.	The project would maintain and/or improve all pedestrian and bicycle facilities and access points along the levee, which also serves as the Bay Trail within the Foster City jurisdictional boundary. Certain segments of the Bay Trail would be temporarily closed during construction; however, only select portions would be closed simultaneously, as directed by the City, to ensure no two contiguous (adjacent) segments would be closed at one time. In addition, Bay Trail detour routes would be provided for trail users.

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
Parks and Open Space Element		
Goal PC-B	*Maintain Existing Recreation Facilities.* Maintain current park amenities and infrastructure in a safe, attractive and functional recreation environment.	The Bay Trail is an important recreation amenity in Foster City, providing pedestrian and bicycle facilities and views to San Francisco Bay and wetlands. The project would maintain and/or improve these facilities, ensuring ongoing access for the community. Segments of the Bay Trail would need to be closed for construction; however, at least part of the trail would be open at all times. In addition, the Bay Trail would be replaced in-kind or better following construction. Therefore, the Bay Trail would be improved at the conclusion of the project.
Goal PC-C	*Maintain and Improve the City's Pedway and Bikeway System.* Maintain and improve the pedway system that surrounds the City of Foster City and the walkway system that provides safe access to parks, schools and other streets.	Segments of the Bay Trail would need to be closed for construction; however, at least part of the trail would be open at all times. In addition, the Bay Trail would be replaced in-kind or better following construction. Therefore, the Bay Trail would be improved at the conclusion of the project.
Policy PC-4	*Park Improvements.* Improve existing parks by adding new facilities to those with identified deficiencies. Work with San Mateo County to provide public use of the Werder Pier restroom facility in conjunction with evaluating other locations for a public restroom facility for use by pedestrians using the levee pedway.	The project would ensure that public restroom facilities in close proximity to the Bay Trail are available for pedestrian and bicycle trail users. This could require coordination with other jurisdictional entities.
Policy PC-7	*Bike Path System.* Develop a City of Foster City bike path system to connect major work, shopping, school, civic and recreational destinations throughout the City.	The Bay Trail is an important part of the Foster City bike path system. The project would maintain and/or improve bicycle facilities on the Bay Trail as well as the connections to the greater Foster City bike path network.
Policy PC-8	*Recreational Use of Pedestrian Walkways.* Improve the recreational use of existing pedestrian walkways where appropriate.	The Bay Trail is an important part of the Foster City pedestrian walkway system. The project would maintain and/or improve pedestrian facilities on the Bay Trail as well as all connections to the greater Foster City pedestrian network.
Policy PC-9	*Pedway and Bikeway System Maintenance and Improvement.* Continue to maintain, expand and improve the existing walkway and pedway system.	The Bay Trail would be replaced in-kind or better following construction.
Policy PC-10	*Improvements in Open Space.* Design any improvements in open space areas to minimize adverse impacts to habitats, including provision of a buffer to minimize human disturbances, views or other open space resources.	The Bay Trail abuts the bay and wetland areas. Impacts to the neighboring habitats were evaluated in the project EIR. Project Mitigation Measures BIO-1a through BIO-4b address these impacts and reduce them to a less-than-significant level.

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
		Impacts to the views were evaluated in the project EIR. Project Mitigation Measures BIO-1a through BIO-4b address these impacts and reduce them to a less-than-significant level. The project includes 700-foot buffer zone around all areas of salt marsh determined to be suitable nesting habitat for Ridgway's rail. If bird nests are found, appropriate buffer zones would be established around all active nests to protect nesting adults and their young from construction disturbance.
Policy PC-12	*Bayfront Open Space System.* Provide a continuous open space system along San Francisco Bay and the Belmont Slough.	The Bay Trail serves as an important feature in the continuous open space system along the bay and Belmont Slough. Facilities and access to these facilities would be maintained and/or improved as part of the project. Certain segments of the Bay Trail would be temporarily closed during construction; however, only select portions would be closed simultaneously, as directed by the City, to ensure no two contiguous (adjacent) segments would be closed at one time. In addition, Bay Trail detour routes would be provided for trail users.
Policy PC-13	*Wetlands Protection.* Protect the health and safety of the community by excluding development in environmentally sensitive areas which would result in a net loss of significant wetlands.	The project's footprint would be generally within and adjacent to the existing levee footprint and consist of maintenance and improvement measures. No new development would be included in the area as a part of the project.
Policy PC-15	*Access to Existing Open Space.* Design open space already in public ownership to be more accessible to the public.	The project would maintain and/or improve all access points from the Bay Trail to open space areas, as appropriate.
Policy PC-16	*Open Space Access for Special Need Groups.* Design open space to be accessible to people with special needs such as elderly and handicapped persons.	The project would maintain and/or improve all pedestrian and bicycle facilities and access points along the levee and would meet all ADA requirements for access.
Policy PC-23	*Cooperation with Other Agencies.* Work with other agencies to promote and provide regional recreation opportunities.	The Foster City levee is part of the Bay Trail that runs the circumference of San Francisco Bay, linking multiple jurisdictions. All improvements would meet regional design standards to ensure access by users from across the region.
Program PC-c	*Implement the City of Foster City Bikeway System Report.* Implement the City of Foster City Bikeway System Report, adopted by the City Council on January 7, 1991.	The levee is an important part of the Foster City bike path system. The project would comply with all guidelines in the Foster City Bikeway System Report.

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
Program PC-g	*Levee Pedway Maintenance.* Maintain the levee pedway, repairing and resurfacing when necessary.	The project includes the maintenance and/or improvement of the levee pedway, which also serves as the Bay Trail within the Foster City jurisdictional boundary.
Program PC-h	*Existing Pedway Enhancement.* Enhance the existing pedway system by providing observation points, water fountains, additional and replacement landscaping, trash cans, additional paved access points with hand rails and additional benches along the pathways.	The project would maintain and/or improve all pedestrian facilities along the levee. Improvements would include observation points, trash cans, benches/seating, and improved access points meeting ADA requirements.
Program PC-j	*Special Needs.* Require that any improvements to open space lands be designed to accommodate people with special needs.	The portion of the Bay Trail within Foster City is a concrete pathway that is accessible to people with special needs. After project construction, the pathway would be replaced in-kind or better; the new trail would be 14 feet wide (10 feet paved with a 2-foot shoulder on each side). Therefore, the trail would be improved and would remain accessible to people with special needs.
Program PC-l	*Wetlands Enhancement.* Improve wetland areas in accordance with state and federal regulations to enhance the natural characteristics of the wetlands.	The project would provide landscaping designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site.
Program PC-s	*Shoreline Band.* Work with the Bay Conservation Development Commission and the Association of Bay Area Governments to protect and enhance the 100-foot shoreline band for conservation and recreation.	The proposed project would require a BCDC permit before work could begin within the shoreline band; therefore, BCDC would review the proposed project and ensure its consistency with the Bay Plan.
Program PC-v	*Bay Trail.* The City of Foster City shall work with the Bay Conservation Development Commission and all other applicable agencies to develop a Bay Trail System.	The proposed project would replace the Bay Trail in-kind or better, thus ensuring the future viability of the Bay Trail system.
Safety Element		
Goal S-B	*Protect from Flood Hazards.* Protect the community from unreasonable risk to life and property caused by flood hazards.	The project involves raising the levee to provide sufficient flood protection in accordance with updated FEMA guidelines, as well as to protect against future sea level rise.
Goal S-D	*Prepare to Respond to Emergencies.* Minimize potential damage to life, environment and property through timely, well-prepared and well-coordinated emergency preparedness, response plans and programs.	Upon project completion all emergency routes will be intact and improved.

TABLE IV-1 APPLICABLE GOALS, POLICIES, AND PROGRAMS FROM THE CURRENT GENERAL PLAN

Goal or Policy Number	Goal or Policy Text	Project's Relationship to Goal or Policy
Policy S-4	*Flood Protection.* The City will maintain the City's levees and lagoon system for flood protection.	The project involves improving the levee to provide sufficient flood protection in accordance with updated FEMA guidelines, as well as to protect against future sea level rise.
Program S-g	*Maintain Levees and Lagoon for Flood Protection.* The City will maintain the City's levees and lagoon for flood protection pursuant to the "Operation and Maintenance Manual, Foster City Levees and Pump Station" and the "Lagoon Management Plan."	The project involves improving the levee to provide sufficient flood protection in accordance with updated FEMA guidelines, as well as to protect against future sea level rise.
Conservation Element		
Policy C-6	*Wildlife Habitat.* Protect the wildlife habitat located in the wildlife refuge, 100-foot regulated shoreline band, wetland areas and the Foster City Lagoon System.	The project could have potential impacts on the wildlife and wetland habitats. There are a number of mitigation measures taken to reduce these impacts. See *Section V.C, Biological Resources* for more details. The project would require a BCDC permit for shoreline improvements within a 100-foot band from Belmont Slough and San Francisco Bay.
Policy C-x	*Public Viewing Areas.* Expand public opportunities to learn about wetland areas and endangered species by creating public viewing areas with exhibits.	Interpretative signage would be placed along the shoreline trail to encourage public awareness of wetlands ecology, endangered species life histories, species/predator interactions, and how predation of sensitive species can be minimized.
Policy C-y	*Wetland Habitat.* Protect wetland habitat from human disturbance by posting signs prohibiting trespassing on vegetation typical of wetland areas.	All personnel and any equipment would be required to stay within the designated work sites and would not be allowed to enter adjacent salt marsh wetlands, drainages, and habitat of listed species.
Policy C-z	*57-Acre Wildlife Refuge.* Prohibit development within 57-acre wildlife refuge.	The project is a capital improvement project on existing infrastructure and does not constitute new development.
Policy C-aa	*Projects in the Vicinity of Shoreline Band.* Strictly control development proposals in the vicinity of the shoreline band.	The project is a capital improvement project on existing infrastructure and does not constitute new development.

Source: City of Foster City General Plan, June 1999, September 2009, February 2010, February 2016; Urban Planning Partners, Inc., 2016.

V. SETTING, IMPACTS, AND MITIGATION MEASURES

This chapter analyzes the environmental topics determined to be potentially significant with regard to the proposed Foster City Levee Protection Planning and Improvements Project ("the project"). Sections V.A through V.L of this chapter address each of these environmental topics by describing the existing setting, discussing the potential impacts that could result from implementation and buildout of the project, and providing mitigation measures designed to reduce most of the significant impacts to a less-than-significant level. One impact in the Aesthetics and Shade and Shadow and one impact in the Noise and Vibration section remain significant and unavoidable even with mitigation measures.

The following subsections outline the scope of the analysis included in this chapter, the organization of the sections, and the methods for determining which impacts are significant.

ENVIRONMENTAL TOPICS

The following environmental topics are analyzed in this chapter:

A. Aesthetics and Shade and Shadow
B. Air Quality
C. Biological Resources
D. Cultural Resources
E. Soils, Geology, and Seismicity
F. Greenhouse Gas Emissions
G. Hazards and Hazardous Materials
H. Hydrology and Water Quality
I. Land Use
J. Noise and Vibration
K. Traffic and Transportation
L. Recreation

The environmental topics for the project that are found not to be significant are briefly discussed in *Chapter VI, CEQA-Required Assessment Conclusions,* under the subheading VI.E, Effects Found Not to Be Significant. These topics include: agriculture and forest resources, mineral resources, population and housing, and public services and utilities.

FORMAT OF TOPIC SECTIONS

Each environmental topic section generally includes two main subsections: (1) Setting; and (2) Impacts (construction and project) and Mitigation Measures. Identified significant impacts are numbered and shown in bold type, and the corresponding mitigation measures are numbered and indented. Significant impacts and mitigation measures are numbered consecutively within each topic and begin with a shorthand abbreviation for the impact section (e.g., AIR for Air Quality). The following abbreviations are used for individual topics:

AES: Aesthetics and Shade and Shadow
AIR: Air Quality
BIO: Biological Resources
CULT: Cultural Resources
GEO: Soils, Geology, and Seismicity
GHG: Greenhouse Gas Emission
HAZ: Hazards and Hazardous Materials
HYD: Hydrology and Water Quality
LAND: Land Use
NOISE: Noise and Vibration
TRANS: Traffic and Transportation
REC: Recreation

The following notations are provided after each identified significant impact and mitigation measure:

SU = Significant and Unavoidable
S = Significant
LTS = Less than Significant

These notations indicate the significance of the impact with and without mitigation.

DETERMINATION OF SIGNIFICANCE

Under the California Environmental Quality Act (CEQA), a significant effect is defined as a substantial, or potentially substantial, adverse change in the environment.[1] Each impact evaluation in this chapter is prefaced by criteria of significance, which are the thresholds for determining whether an impact is significant.

[1] Public Resources Code Section 21068.

The criteria of significance identified in this EIR are intended to implement and supplement provisions in the CEQA Guidelines for determining the significance of environmental effects, including Sections 15064, 15064.5, 15065, and 15382, and Appendix G.

CEQA requires the analysis of potential adverse effects of the project on the environment. Potential effects of the environment on the project are legally not required to be analyzed or mitigated under CEQA according to the California Supreme Court's decision in *California Building Industry Association v. Bay Area Air Quality Management District.*[2] However, this document nevertheless analyzes potential effects of the environment on the project in order to provide information to the public and decision-makers. Where a potential significant effect of the environment on the project is identified, the document, as appropriate, identifies project-specific non-CEQA recommendations to address these issues as mitigation measures.

A summary of the project's relationship to each significance criteria is provided at the beginning of the impact and mitigation measures subsection for each topic.

CUMULATIVE ANALYSIS CONTEXT

CEQA defines cumulative as "two or more individual effects which, when considered together, are considerable, or which can compound or increase other environmental impacts." Section 15130 of the CEQA Guidelines requires that an EIR evaluate potential environmental impacts when the project's incremental effect is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual 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. These impacts can result from a combination of the proposed project together with other projects causing related impacts. "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects."

The methodology used for assessing cumulative impacts typically varies depending on the specific topic being analyzed. For example, the geographic and temporal (time-related) parameters related to a cumulative analysis of air quality impacts are not necessarily the same as those for a cumulative analysis of noise or aesthetic impacts. This is because the geographic area that relates to air quality is much larger and regional in character than the geographic area that could be impacted by potential noise or aesthetic impacts from a proposed project and other cumulative projects/growth. The noise and aesthetic

[2] *California Building Industry Association v. Bay Area Air Quality Management District*, 2015. No. S213478, December 17.

cumulative impacts are more localized than air quality and transportation impacts, which are more regional in nature. Accordingly, the parameters of the respective cumulative analyses in this document are determined by the degree to which impacts from this project are likely to occur in combination with other development projects.

A. AESTHETICS AND SHADE AND SHADOW

This section evaluates the potential effects of the proposed project on visual resources in the vicinity of the project site. Visual resources are the natural and cultural features of the landscape that can be seen and that contribute to the public's appreciative enjoyment of the environment. The project's consistency with Foster City General Plan policies relevant to aesthetics is also considered. The analysis in this section is partly based on visual simulations of the project site that depict "before" and "after" conditions.

1. Environmental Setting

This subsection briefly introduces the concept of viewer sensitivity and describes the existing visual character of the project site, its immediate surroundings, and the general project vicinity.

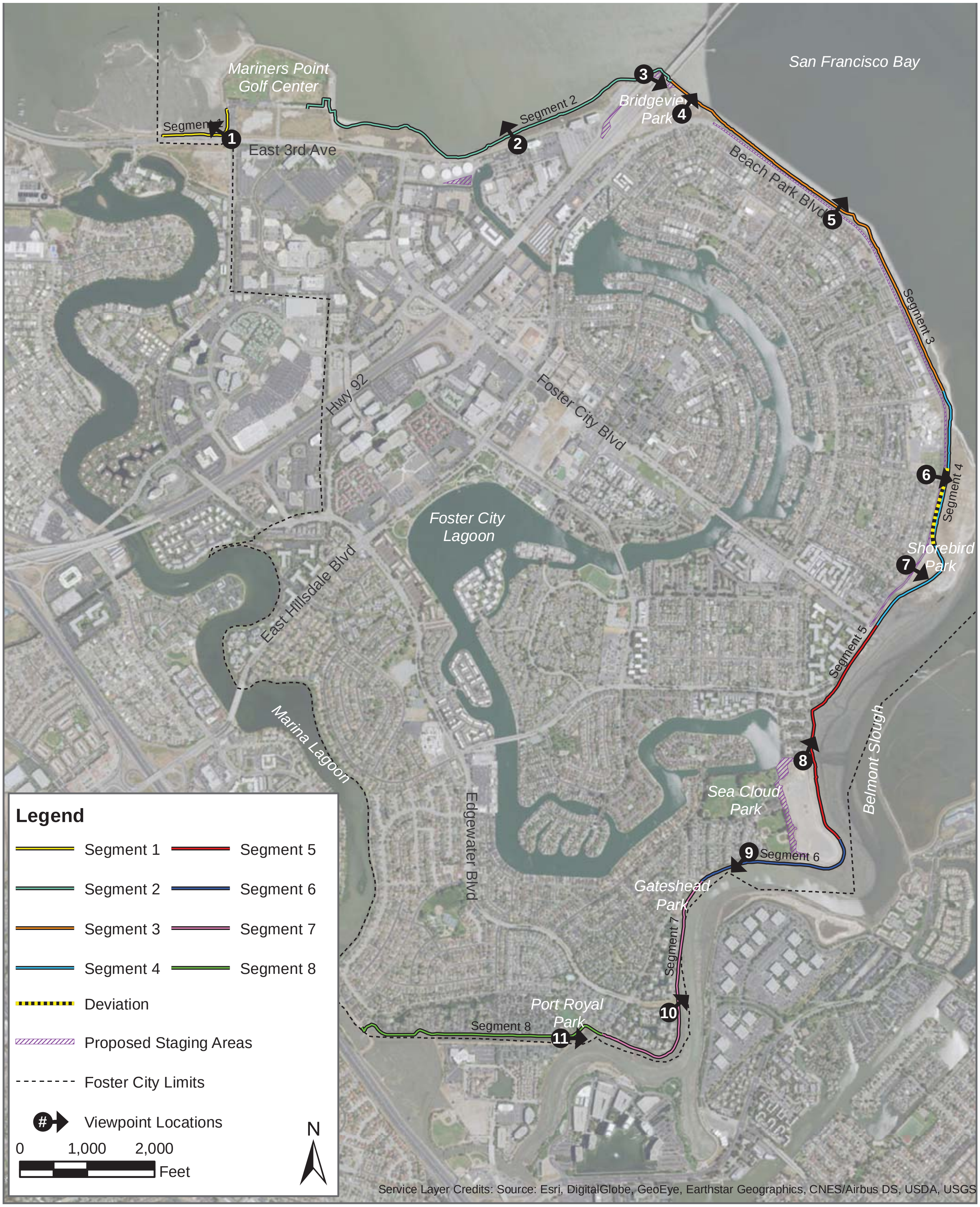
a. Local Context

As discussed in *Section V.I, Land Use,* of this EIR, Foster City is a "Planned Community" constructed and implemented on the basis of an organized program of development.

(1) Surrounding Existing Visual Character of the Project Site

The project site is generally located within the footprint of the approximately 43,000-foot (8 miles) existing levee system with a slight deviation from the existing levee system footprint. The project site also includes six staging areas. The levee is divided into eight different segments to provide site-specific detail, as illustrated in Figure V.A-1. The eight segments begin at the San Mateo city limit to the north (adjacent to East 3rd Avenue), extend parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and end adjacent to U.S. Highway 101 to the south (at the San Mateo/Belmont city limit). Most of the project site has raised earthen levees, with the exception of the southeast portion of the site (segment 8), which has several sections of raised earthen levees with concrete floodwalls. The San Francisco Bay Trail (Bay Trail) is a multi-purpose recreational trail that runs either on top of or immediately adjacent to the levee, and is generally paved throughout the entire levee system. The deviation from the existing levee system is located in segment 4 along Beach Park Boulevard, as shown in Figure V.A-1.

Six staging areas along the levee are proposed for the contractor to access the project site, as shown in Figure V.A-1. The first staging area is located in the City's Corporation Yard within the parking lot (0.6 acre) behind three water towers, just southeast of the intersection of East 3rd Avenue and Foster City Boulevard. Three additional staging areas, two, three, and four, are proposed near the base of the San Mateo Bridge/SR 92: (2) a 0.8-acre staging area in a dirt lot to the west of State Route 92, approximately 0.2 mile southwest of the San Mateo Bridge/SR 92; (3) a 0.3-acre staging area west of the bridge in a dirt lot; and (4) a 0.2-acre staging area to the east of the bridge in a dirt area with picnic benches. A fifth 5.4-acre staging area, is proposed along Beach Park Boulevard



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-1
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint Locations Map

for approximately 1.7 miles from Bridgeview Park to the intersection with Foster City Boulevard. The sixth staging area is a 3.8-acre site along the perimeter of the Dredge Disposal Site on the landward side of the levee between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough.

The existing levee ranges in elevation from 11–13 feet above the North American Vertical Datum of 1988 (NAVD 88)[1] and varies in width from 14–16 feet NAVD throughout. Narrow bands of land and vegetation or landscaping are on either side of the levee.

To assess the magnitude of the impacts, eleven representative viewpoints were selected along the length of the project site (see Figure V.A-I). Photos representing existing conditions at the viewpoints were taken in June and August 2016.

(2) Viewer Sensitivity

Both natural and created features in a landscape contribute to its visual character and quality. The visual character and quality of a landscape are only important insofar as they are observed and evaluated by observers/viewers. Viewer sensitivity is considered in assessing the effects of visual change and is predicated upon several factors: the visibility of visual resources in the landscape; the proximity of the viewers to a visual resource; the elevation of the viewers relative to the visual resource; the frequency and duration of views; the numbers of viewers; and the types and expectations of individuals and viewer groups.

Viewers along the project site are expected to primarily fall into one of the following three categories:

1) Recreationists walking, running, or biking along the Bay Trail or sitting on benches, as well users of the five parks along the project site. People engaged in recreational activities generally have a heightened sense of awareness of their surroundings, are familiar with the scenic resources in the area, and seek aesthetically pleasing areas to enhance their recreational experience. Therefore, these viewers are expected to be highly sensitive to visual changes in the surrounding landscape.
2) Residents and businesses adjacent to the project site. While residential areas are in close proximity along many segments of the levee, residents that would be the most affected by the project and work along the project site are those located primarily in the southern portion of the levee along Belmont Slough (segments 6 through 8, seen on Figure V.A-1). Many of the townhouses and apartment complexes in this area are immediately adjacent to the levee, and these viewers are expected to be sensitive to

[1] The NAVD 88 consists of a leveling network on the North American Continent, ranging from Alaska, through Canada, across the United States, affixed to a single origin point on the continent. In 1993, the NAVD 88 was affirmed as the official vertical datum in the National Spatial Reference System for the Conterminous United States and Alaska. FEMA's official mapping products use this datum.

visual changes in the landscape. Although the views of private property owners are discussed, potential impacts are not considered significant because California Environmental Quality Act (CEQA) (Pub. Resources Code, §21000 et seq.) case law has established that only public views, not private views, need be analyzed under CEQA.[2]

3) Motorists on East 3rd Avenue and Beach Park Boulevard have direct views of the project site in segments 1 through 4, as well as the northern portion of segment 5. None of the roads in the southern portion of segment 5 or in segments 6 through 8 are in the proximity of the project site. While speed limits in Foster City are generally low enough to allow motorists to observe their surroundings as they commute, it is presumed that motorists are less concerned about the view as they are focused on driving and only briefly present along any given portion of the project. Therefore, these viewers are expected to have low sensitivity to visual changes in the landscape.

Segment 1: San Mateo City Limit to west side of Mariners Point Golf Center

The first 0.2 mile of segment 1 is bordered by wetlands on the bayside and East 3rd Avenue on the landward side. The levee then heads north toward San Francisco Bay; this north-south segment is approximately 400 feet long. The next, approximately 0.6-mile-long portion of the levee is adjacent to Mariners Point Golf Center and is not part of the proposed project. The paved Bay Trail runs along the earthen levee and has a low wood-and-wire fence separating it from the wetlands. Viewpoint 1 is located in the eastbound lane of East 3rd Avenue just northwest of the intersection of East 3rd Avenue and Mariners Island Boulevard, as shown in Figure V.A-2. This view faces northwest toward the wetlands and San Francisco Bay. The next portion of the levee is adjacent to Mariners Point Golf Center and is not part of the proposed project.

Segment 2: East side of Mariners Point Golf Center to San Mateo Bridge/SR 92

Segment 2 begins on the east side of Mariners Point Golf Center and is bordered by the open water of San Francisco Bay for the first 0.2 miles, shown in Figure V.A-3. Where segment 2 meets East 3rd Avenue, the next 0.7-mile portion of the levee is bordered by San Francisco Bay on the bayside and East 3rd Avenue on the landward side. A strip of disturbed and mainly non-native vegetation separates the levee/Bay Trail from the road. Viewpoint 2 represents a view from East 3rd Avenue toward the project site and San Francisco Bay. Several large office buildings are located approximately 200 feet south of the levee as the levee approaches the San Mateo Bridge/SR 92. Segment 2, on the bayside, is made up primarily of riprap. Viewpoint 3 is located on the Bay Trail just west of the San Mateo Bridge/SR 92 and faces east toward the bridge. The levee in this segment is earthen and topped by a paved section of the Bay Trail. This segment ends just east of the San Mateo Bridge/SR 92.

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[2] Association of Bay Area Governments (ABAG), 2014c. Plan Bay Area. Visual Resources. http://planbayarea.org/pdf/Draft_EIR_Chapters/2.10_Visual.pdf, accessed August 19, 2016.

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-2
Foster City Levee Protection Planning and Improvements Project EIR
Segment 1 Vicinity

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-3
Foster City Levee Protection Planning and Improvements Project EIR
Segment 2 Vicinity

Segment 2, looking northeast along East 3rd Avenue

Segment 2, looking west along East 3rd Avenue

Segment 3: San Mateo Bridge/SR 92 to Beach Park Boulevard/Tarpon Street

Segment 3 starts on the eastern side of the San Mateo Bridge/SR 92 (Figure V.A-4)**.** The levee and Bay Trail run under the bridge. From here, Beach Park Boulevard runs parallel to the levee on the landward side for the first 0.2 mile of segment 3 and is bordered by the open water of San Francisco Bay on the bayside, which is entirely made up of riprap. On the landward side is Bridgeview Park. The next approximately 0.6-mile portion of segment 3 is characterized by mudflats and the open water of San Francisco Bay. The Bay Trail is paved, and a strip of vegetation separates the earthen levee and Bay Trail from Beach Park Boulevard. The levee continues for another 0.6 mile; about halfway into this segment, a small section of land and wetlands juts out approximately 250 feet into the bay at the Foster City Shell Bar. Viewpoints 4 and 5 represent views from Bridgeview Park and Beach Park Boulevard toward the project site and San Francisco Bay.

Segment 3, looking southeast along Beach Park Boulevard

Segment 3, under the San Mateo Bridge/SR 92, looking northwest

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-4
Foster City Levee Protection Planning and Improvements Project EIR
Segment 3 Vicinity

Segment 4: Beach Park Boulevard/Tarpon Street to Foster City Boulevard

At the beginning of segment 4, a small section of land/wetlands juts out approximately 250 feet into the bay. This segment of the levee has very little riprap (only along a few brief stretches). Along segment 4, the levee continues running parallel to Beach Park Boulevard, with a field of vegetation on the bayside and single-family residences on the landward side as shown in Figure V.A-5. The levee then briefly cuts east, away from Beach Park Boulevard, before cutting west and rejoining it. Along this section, the paved Bay Trail is adjacent to the earthen levee. Viewpoint 6 represents a view from Beach Park Boulevard at Swordfish Street toward the beginning of the deviation area. Viewpoint 7 represents a view from Beach Park Boulevard looking out across Shorebird Park towards the Belmont Slough. The levee then briefly cuts east, away from Beach Park Boulevard, before cutting west and rejoining it. This 0.25-mile portion is bordered by a field of vegetation lies on the bayside, and Shorebird Park (an open space area with picnic benches) is on the landward side of the levee.

Segment 4, Looking east from Shorebird Park

Segment 4, Looking northeast from Shorebird Park

Segment 5: Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park

Along segment 5, the next 0.3 mile of the earthen levee is bordered by wetlands along Belmont Slough on the bayside and the paved Bay Trail on the landward side. Adjacent to the Bay Trail is landscaping, which provides a buffer from a mix of single-family and multiple-family housing. Multiple large transmission towers are located within the wetlands along this segment. At this point, the levee diverges from Beach Park Boulevard. The next 0.3 mile of the levee features wetlands on the bayside of the levee and two groups of developments, the Marina Point condominiums, and the Bayfront townhouses, that are less than 100 feet from the levee. The levee segment then continues alongside townhouses, but separated by a wide median as well as Wheel House Lane; the townhouses end at the end of Wheel House Lane, and the next 0.45 mile of the levee

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-5
Foster City Levee Protection Planning and Improvements Project EIR
Segment 4 Vicinity

Segment 5, looking south toward Sea Cloud Park

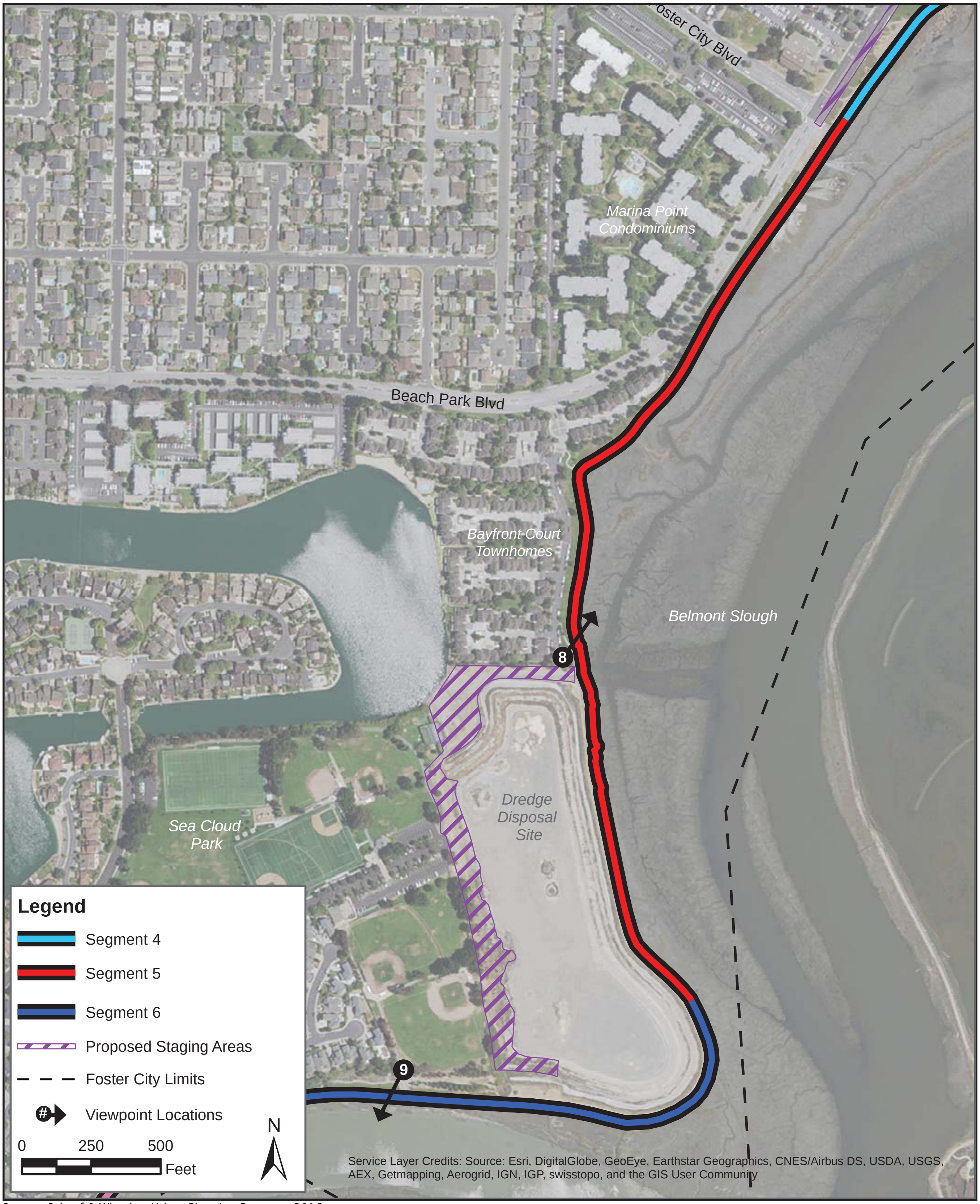
Segment 5, looking north along Wheel House Lane

features a fenced vacant field on the landward side (adjacent to Sea Cloud Park) with wetlands on the bayside. Viewpoint 8 is located in the middle of segment 5, at the southern end of Wheel House Lane (as shown in Viewpoint V.A-6). The view faces northeast, toward the fenced Lagoon Intake Structure and the wetlands beyond.

Segment 6: Belmont Slough to Gateshead Park

The next 0.25-mile portion of the levee runs alongside the wetlands of Belmont Slough in segment 6, shown in Figure V.A-7. On the landward side, it passes a sports field and Sea Cloud Park, followed by a single-family residential development, Alden Park. Here, the levee is mainly shielded from view by a perimeter of trees and bushes. However, in some places, residences are located directly adjacent to and in full view of the levee. The next 0.75 mile of the levee is bordered by Belmont Slough on the bayside and single-family and multiple-family residences on the landward side. Viewpoint 9 is located just inside the southern end of Sea Cloud Park; this view faces southwest across Belmont Slough toward the Redwood Shores community.

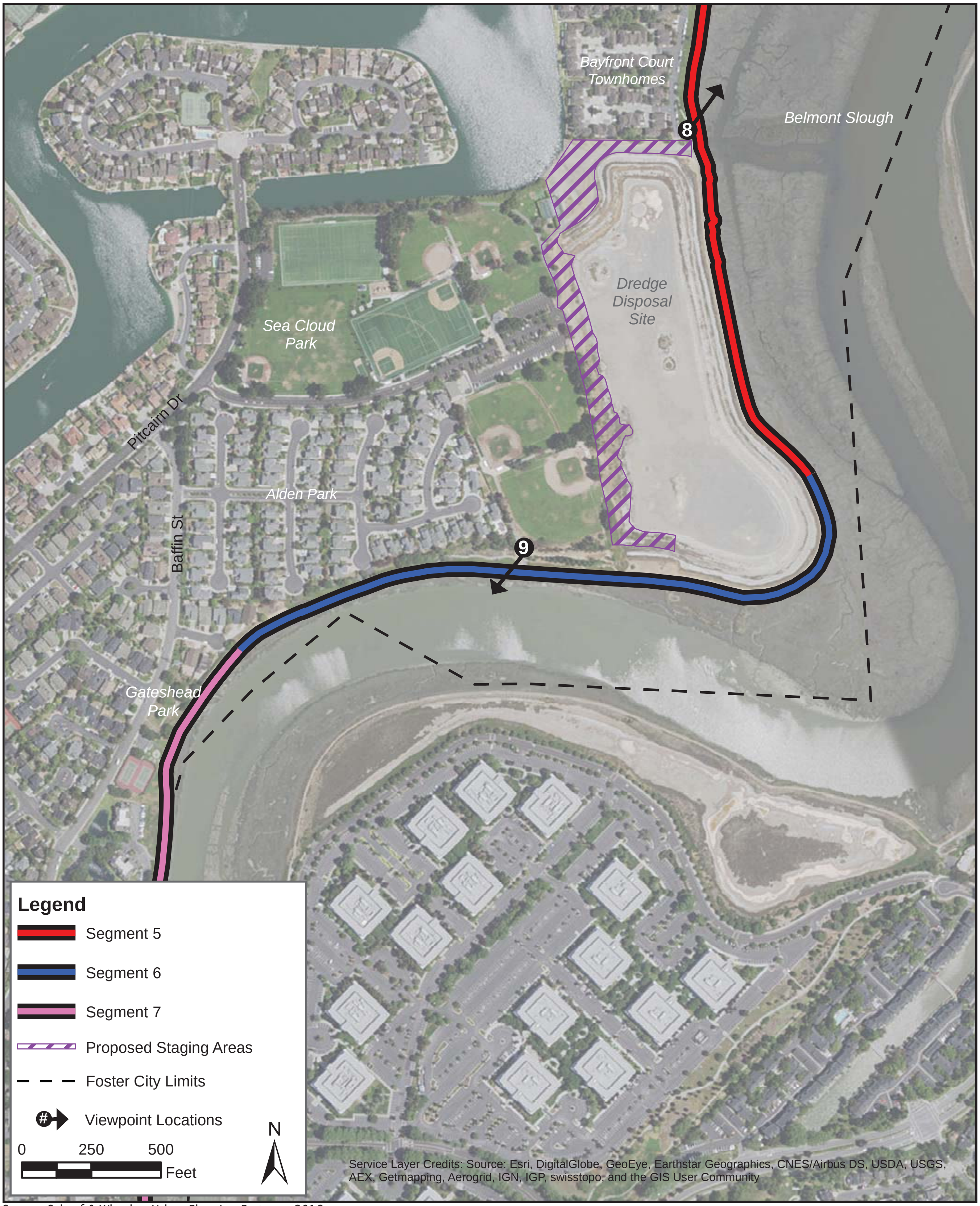
The southern end of Sea Cloud Park features a baseball field. There is also a picnic area with benches along this viewpoint. Therefore, this viewpoint is representative of a view that is adjacent to multiple recreational opportunities. The levee is earthen and the paved Bay Trail continues to run adjacent to the levee. This segment ends at Gateshead Park.



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-6
Foster City Levee Protection Planning and Improvements Project EIR
Segment 5 Vicinity



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-7

Foster City Levee Protection Planning and Improvements Project EIR

Segment 6 Vicinity

Segment 7: Gateshead Park to Port Royal Park

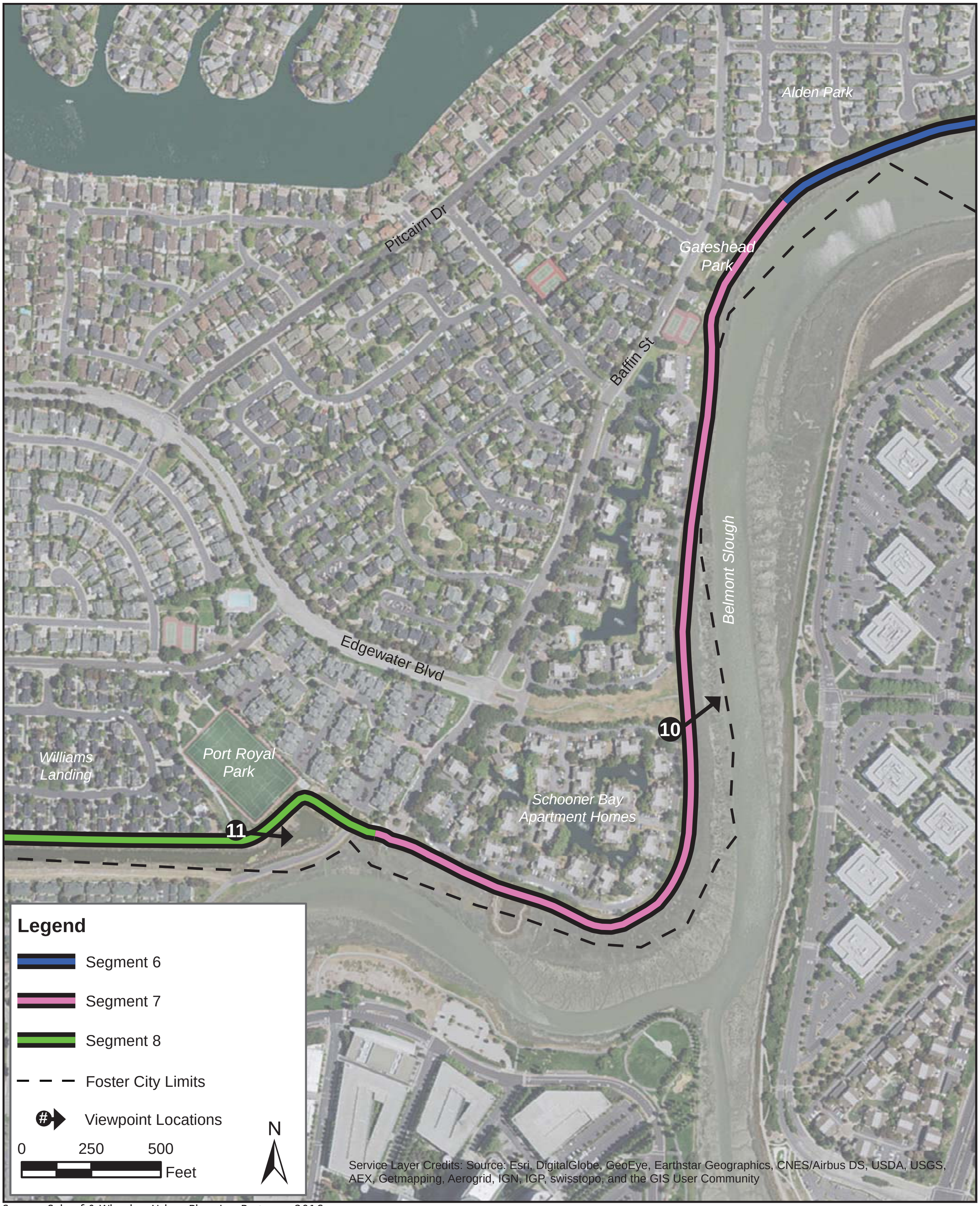
Segment 7 continues through Belmont Slough, beginning at Gateshead Park, which is a small open space with benches, shown in Figure V.A-8. On the landward side, the earthen levee and paved Bay Trail are adjacent to landscaping, single-family residence, and a residential apartment complex (Schooner Bay Apartment Homes). Viewpoint 10 is located in the vegetated park-like area between Cutwater Lane and Timberhead Lane, and is near both residences and recreational opportunities. This view faces northeast across Belmont Slough toward Redwood Shores.

Segment 7 looking south towards Gateshead Park

Segment 7 looking north along Timberhead Lane

Segment 8: Port Royal Park to Belmont City Limit

The next 0.1-mile of the levee traverses along wetlands on the bayside and single-family and multiple-family residences, as well as the Port Royal Park and soccer field, on the landward side. The next 0.2 mile of the levee is the only section with a floodwall; it is located on the bayside of the San Francisco Bay Trail (Bay Trail). The Bay Trail sits on top of the levee in segment 8, which is also the only portion of the levee with a concrete floodwall (Figure V.A-9). The floodwall is on the bayside of the Bay Trail, between the trail and Belmont Slough. The landward side of the levee consists of multi-family residences, including townhouses in Williams Landing and the Lantern Cove Apartments, immediately adjacent to the levee. The townhouses in Williams Landing are the nearest residences to the levee along the entire 8-mile segment and are separated from the levee and paved Bay Trail by a fence. Viewpoint 11 is located at the beginning of this segment in the southeastern corner of Port Royal Park, and faces east toward residences and Belmont Slough.



Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-8
Foster City Levee Protection Planning and Improvements Project EIR
Segment 7 Vicinity

Source: Schaaf & Wheeler, Urban Planning Partners, 2016

Note: The location of staging areas are preliminary and may change.

Figure V.A-9
Foster City Levee Protection Planning and Improvements Project EIR
Segment 8 Vicinity

Segment 8, looking east

Segment 8, looking west

b. Regulatory Context

Applicable regulatory provisions are discussed below. Included in this discussion are policies of the Foster City General Plan and regulations of the Foster City Zoning Code.

(1) Foster City General Plan

The Foster City General Plan contains the following goals and policies related to aesthetics and shade/shadow impacts.

Parks and Open Space Element

- *PC-1 Recreation Needs.* Respond to the recreation needs identified in the Parks and Open Space Element of the City of Foster City General Plan and meet the long-term projected recreation needs and preferences of individuals and groups within the community.
- *PC-8 Recreational Use of Pedestrian Walkways.* Improve the recreational use of existing pedestrian walkways where appropriate.
- *PC-9 Pedway and Bikeway System Maintenance and Improvement*. Continue to maintain, expand and improve the existing walkway and pedway system.
- *Policy PC-10: Improvements in Open Space.* Design any improvements in open space areas to minimize adverse impacts to habitats, including provision of a buffer to minimize human disturbances, views or other open space resources.
- *PC-12 Lagoons and Waterways: Open Space*. Preserve and maintain the existing lagoon and waterways.
- *PC-12 Bayfront Open Space System:* Provide a continuous open space system along San Francisco Bay and the Belmont Slough.

2. Impacts and Mitigation Measures

This subsection discusses the potential impacts on aesthetics and shade/shadow that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the aesthetics and shade/shadow impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

Implementation of the proposed project would have a significant impact on aesthetic resources or related shade or shadow if it would:

- Have a substantial adverse effect on a scenic vista.[3]
- Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway.
- Substantially degrade the existing visual character or quality of the site and its surroundings.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the areas.
- Cast a shadow that substantially impairs the beneficial use of any public or quasi-public park, lawn, garden, or open space.

The shadow impact threshold (last criterion) reflects the intent of the City of Foster City (the City)'s General Plan policies that seek to preserve access to sunlight on public open spaces, and as described in the Regulatory Context subsection above. This criterion was developed based on similar thresholds used in comparable jurisdictions. The other four thresholds of significance are drawn from Appendix G of the CEQA Guidelines.

b. Less-than-Significant Aesthetic and Shade/Shadow Impacts

Discussed below are the less-than-significant aesthetic and shade/shadow impacts that could result from development of the proposed project.

(1) Scenic Resources Within a State Scenic Highway

California State Route (SR) 92 also referred to as the San Mateo Bridge, is the only state highway in the vicinity of the project site. According to the California Department of Transportation (Caltrans), no part of SR 92 is an Officially Designated State Scenic

[3] A scenic vista is defined by CEQA as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public

Highway. One section of SR 92 – from SR 1 near Half Moon Bay to Interstate 280[4] – is an Eligible State Scenic Highway; however, this section is not within the site vicinity. The proposed project would not result in the damage of trees, rock outcroppings, historic buildings, or other scenic resources viewed from a State Scenic Highway. Therefore, the impact would be less than significant.

(2) Shade/Shadow

Shade/shadow impacts are typically caused by the erection of buildings or other large structures. The proposed project would raise the levee elevation by no more than 10.5 feet, depending on the scenario but the wall height would be no more than 3.5 feet above the Bay Trail with the exception of a portion near and under the San Mateo Bridge/SR 92. At this location, the levee conventional wall would be at its highest of 10 feet from grade under the 2100 Sea Level Rise scenario, but only for a short distance of 110 feet along the pathway on the landward side. Current and future use takes place on top of the levee/Bay Trail, so the increased shading caused by the added levee elevation would be very minor and would not affect the use of any public or quasi-public space immediately adjacent to the project site. Therefore, the impact would be considered less than significant.

(3) Light and Glare

The raising of the levee would not introduce any permanent lighting into the viewshed. Furthermore, all construction work would be conducted during the daytime hours specified in the Foster City ordinance; therefore, no temporary lighting would be needed and the impact would be less than significant.

(4) Scenic Vistas and Visual Character – Construction Activity

Chapter III, Project Description, describes the construction activities, which would include pile driving, paving, grading, landscaping, and stockpiling at six temporary staging areas shown on Figure III-1. Construction can cause dust, and material stockpiles can create an untidy appearance, collectively degrading the integrity and visual character of the surroundings that would result in temporary visual impacts.

Staging

Six staging areas along the levee are proposed for the contractor to access the project site as shown in Figure V.A-1. Equipment staged on the project site could include passenger vehicles such as pick-up trucks as well as cranes, truck tractors, excavators, and other construction equipment. Site preparation for the staging site would be minor and would include the placement of erosion control materials and spill prevention materials such as

[4] California Department of Transportation (Caltrans), 2016. California Scenic Highway Program. http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/scenic_hwy.htm, updated March 16, 2016, accessed June 7.

silt fence and straw wattles, as required by the San Mateo Countywide Stormwater Pollution Prevention Plan.

During construction, equipment within the staging site could obscure and/or clutter existing views of public parks, San Francisco Bay, and Belmont Slough from the Bay Trail and/or from private residences. This would create a temporary visual impact that would extend throughout the duration of the project, for approximately 1.5–2 years under the 2050 Sea Level Rise scenario or 2–2.5 years under the 2100 Sea Level Rise scenario.

However, because project construction activities would be temporary, impacts to scenic vistas and visual character from these activities are also considered temporary, and thus less than significant under CEQA.

c. Significant Aesthetic Impacts and Mitigation Measures

Implementation of the proposed project would result in significant aesthetic impacts, as described below.

(1) Scenic Vistas and Visual Character - Post-Construction Conditions

The Bay Trail lies on top of or adjacent to the levee system, which provides scenic vistas of San Francisco Bay and Belmont Slough. According to the City's General Plan EIR there are no official scenic vistas in Foster City; however there are several scenic resources including the Belmont Slough and San Francisco Bay. For the purpose of providing a conservative analysis, the Belmont Hills are also considered a scenic resource. The levee system improvements would also be visible from private viewpoints within several residential communities and from multiple public parks.

Impact AES-1: **The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario. (S)**

Table V.A-I shows the existing levee elevations in each segment, as well as the proposed levee elevations and improvement types. The change in levee elevation, proposed levee improvement type, and viewer sensitivity would determine the magnitude of the impacts on visual character in each segment. The finished sheet pile wall elevation for all segments would be no more than 3.5 feet above the Bay Trail, except under the San Mateo Bridge/SR 92 where the wall reaches a maximum height of 10 feet under the 2100 Sea Level Rise scenario.

TABLE V.A-1 LEVEE/FLOODWALL ELEVATION MATRIX

Segment	Existing Levee Elevation	Levee/Floodwall Elevations for 2050 Sea Level Rise	Levee/Floodwall Elevations for 2100 Sea Level Rise	Elevation Increase from Existing Conditions (2050 Sea Level Rise)	Elevation Increase from Existing Conditions (2100 Sea Level Rise)
1	>13	15	18.5	2	5.5
2	12–13	19	22	6–7	9–10
3	12–13	18	21.5	5–6	8.5–9.5
4	11–12	13.5–18	16–21.5	2.5–7	5–10.5
5	12	13.5	16	1.5	4
6	12	13.5	16	1.5	4
7	12–13	13.5	16	0.5–1.5	3–4
8	12–13	13.5	16	0.5–1.5	3–4

Note: All measurements are shown in feet. Where there is a range in elevation across scenarios, the incline and decline would correlate across each scenario.
Source: Schaaf & Wheeler, 2016.

TABLE V.A-2 FLOODWALL HEIGHT MATRIX

Segment	Floodwall Height for 2050 Sea Level Rise	Floodwall Height for 2100 Sea Level Rise
1	NA	3.5
2	3.5–7	3.5–10
3	3.5	3.5
4	3.5	3.5
5	3.5	3.5
6	3.5	3.5
7	3.5	3.5
8	3.5	3.5

Note: All measurements are shown in feet. The range in floodwall height under segment 2 accounts for the increase in height near the San Mateo Bridge/SR 92.

Source: Schaaf & Wheeler, 2016.

As described previously in *Existing Visual Character of the Project Site*, to assess the magnitude of the impacts, 11 representative viewpoints were selected along the length of each of the segments of the project site (see Figure V.A-I). The existing conditions for each of the 11 viewpoints are shown in photographs to follow. Figures V.A-9 through V.A-20 set forth below provide visual simulations showing before and after conditions of the viewpoints as they would appear under two scenarios: 2050 Sea Level Rise and 2100 Sea Level Rise.

The photos portraying existing conditions from the eleven viewpoints looking to the levee from adjacent public parks, parking lots, or streets, are provided in the Impacts and Mitigation Measures section below, These photos were taken with a Panasonic DMC-LX5 with a 24mm equivalent focal length lens. To create the renderings, three additional photos were taken from the same location and with the same angle of view and magnification, with an employee holding an 8-foot surveying pole on the trail at different locations spread out across the angle of view. The height markings on the pole were used to represent the proposed heights of the trail and wall under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios. Afterwards, each rendering was processed using the Adobe Photoshop software. To create the visual simulations depicting 2050 and 2100 Sea Level Rise, the levee profile was analyzed along the station points represented within the angle of view to determine the future trail and wall elevations. The wall and trail was digitized to reflect the proposed elevations and then the proposed view was reviewed for accuracy. Lastly, images of trail users were superimposed, along with vegetation where required.

Segments 1, 5, 6, 7, and 8

The increase in levee elevation along segment 1 would be 2 feet under the 2050 Sea Level Rise scenario and 5.5 feet under the 2100 Sea Level Rise scenario. The increases in levee elevation along segments 5, 6, 7, and 8 would be minor: 0.5–1.5 feet under the 2050 Sea Level Rise scenario and 3–4 feet under the 2100 Sea Level Rise scenario. The impacts in each of these segments are discussed in further detail below.

Segments 2, 3, and 4

The largest increases in levee elevation would occur along segments 2, 3, and 4: 2.5–7 feet under the 2050 Sea Level Rise scenario and 5–10.5 feet under the 2100 Sea Level Rise scenario. The impacts in each of these segments are discussed in further detail below.

Segment 1: Small Segment East of San Mateo City Limits

Under the 2050 and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 2 feet and 5.5 feet, respectively. No residences are adjacent to this segment so only recreationists and motorists would be affected. As shown in Figure V.A-10 the view at Viewpoint 1 under the 2050 Sea Level Rise scenarios would remain similar to existing conditions.

Existing Viewpoint 1: Looking Northwest from East 3rd Avenue

Source: BFS Landscape Architects, 2016.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-10
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 1: Looking Northwest from East 3rd Avenue

Under the 2100 Sea Level Rise scenario, the addition of the sheet pile wall would noticeably alter the visual character along this segment. However, the finished wall height (i.e., the completed wall height) would be no more than 3.5 feet above the Bay Trail and recreationists would still maintain their existing view of the bay and hills/mountains in the East Bay along the trail. Once completed, the appearance of the wall could be enhanced with a variety of landscaping treatments. As shown in the photo below, under existing conditions, motorists' view along East 3rd Avenue of the bay and hills/mountains is partially obstructed due to the existing slope of the landscaped area on the north side of the road. The addition of sheet pile wall under the 2100 Sea Level Rise scenario would not obscure the view noticeably compared to existing conditions. Therefore, the impact to recreationists and motorists under the 2100 Sea Level Rise scenario would be considered less than significant.

The impact to scenic vistas and visual character under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would be less than significant.

Segment 2: Mariners Point Golf Center to San Mateo Bridge/SR 92

Under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 6–7 feet and 9–10 feet, respectively. No residences are adjacent to this segment; thus, only recreationists and motorists would be affected.

Existing Viewpoint 2: Looking North from East 3rd Avenue

Source: BFS Landscape Architects, 2016.


2050 Sea Level Rise Scenario


Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-11
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 2: Looking North from East 3rd Avenue

Currently, trail users view San Francisco Bay or associated wetlands immediately adjacent to most of the Bay Trail. Under the proposed project, the Bay Trail would be elevated compared to existing conditions under all three scenarios, as shown in Viewpoint 2 in Figure V.A-11. As a result, trail users would view the bay and other aesthetically pleasing features from an elevated viewpoint. Some users might prefer the elevated viewpoint while others might wish to cycle, walk, or jog at the same elevation as their surroundings; such a determination is subjective and thus would vary from user to user. In addition, a sheet pile wall would be installed adjacent to much of the Bay Trail. However, the finished wall height would be no higher than 3.5 feet above the trail under all scenarios[5]; therefore, the trail users' view of the surroundings would not be obstructed.

For motorists traveling along East 3rd Avenue, existing views of San Francisco Bay would be completely blocked by the sheet pile wall along this segment, as shown in Viewpoint 2 in Figure V.A-11. Motorists generally travel at higher speeds and are not as concerned with their aesthetic surroundings as recreationists. Although the post-project change to the view would be noticeable under all three scenarios, the impact to motorists along this segment would not be significant because it is assumed that motorists would be focused on the road while driving.

The only exception to the 3.5-foot maximum floodwall height above the Bay Trail would be immediately underneath the San Mateo Bridge/SR 92, where a conventional floodwall[6] would be required and the Bay Trail could not be raised due to insufficient vertical clearance beneath the bridge. In this area, the wall height above the trail on the landward side under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would be approximately 7 feet and 10 feet, respectively. Figure V.A-12 shows Viewpoint 3 under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios. On either side of the San Mateo Bridge/SR 92, the trail would slope upward at an average of 5 percent to resume the 3.5-foot maximum height. The wall would exceed the maximum height above the trail for a relatively minor distance of a total of approximately 110 feet on either side of the bridge. Therefore, the impact to recreationists along this segment would be less than significant.

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[5] With the exception of the sections near and under the San Mateo Bridge/SR 92 where wall heights would reach up to 10 feet. However, the wall will be on the landward side and would not impact views of the bay.

[6] This is one of the two areas where a conventional wall would be installed.

Existing Viewpoint 3: Looking East Beneath the San Mateo Bridge/SR 92

Source: BFS Landscape Architects, 2016.

Segment 3: San Mateo Bridge/SR 92 to Beach Park Boulevard/Tarpon Street

Under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 5–6 feet and 8.5–9.5 feet, respectively (similar to segment 2), as shown in Viewpoints 4 and 5 in Figure V.A-13 and V.A-14. No residences are immediately adjacent to this segment; thus, only recreationists and motorists would be affected.

Similar to segment 2, the impact to motorists would be less than significant as it is assumed they would be focused on the road while driving. The impact to recreationists along the Bay Trail would be less than significant because trail users would still be able to see the bay and other aesthetically pleasing features from an elevated viewpoint over the 3.5–foot wall; Bridgeview Park is immediately adjacent to the levee/Bay Trail just east of the San Mateo Bridge/SR 92 and includes a planter area and benches. Views of San Francisco Bay are not visible; therefore the installation of a new sheet pile wall would not further obstruct the view for park users, as shown in Figure V.A-13. Therefore, the impact to recreationists at Bridgeview Park, including people sitting on benches, would be less than significant in this segment under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-12
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 3: Looking East Beneath the San Mateo Bridge/State Route 92

Existing Viewpoint 4: Looking East from Bridgeview Park

Source: BFS Landscape Architects, 2016.

Existing Viewpoint 5: Looking Northeast from Beach Park Boulevard

Source: BFS Landscape Architects, 2016.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-13
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 4: Looking East from Bridgeview Park

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-14
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 5: Looking Northeast from Beach Park Boulevard

Segment 4: Beach Park Boulevard/Tarpon Street to Foster City Boulevard

Under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 2.5–7 feet and 5–10.5 feet, respectively, with levee elevations decreasing toward the southern end of the segment.

The deviation area along Beach Park Boulevard would begin near the intersection of Swordfish Street and end near the northern edge of Shorebird Park, as shown in Viewpoint 6 in Figure V.A-15. Along this stretch, the road would lose one lane of parking on the bayside of Beach Park Boulevard. The views for trail users would not be altered. Although views of San Francisco Bay would remain obscured for motorists along Beach Park Boulevard, this is not considered a significant impact because it is assumed that motorists would be focused on the road while driving.

Shorebird Park is located toward the southern end of this segment, and Viewpoint 7 is just south of Shorebird Park, as shown in Figure V.A-16. The park includes several picnic benches. Although levee elevations would be generally lower in this segment than in segments 2 and 3, the views of San Francisco Bay would remain partially obscured for recreationists including people sitting on benches, in Shorebird Park. Therefore, the overall impact to scenic vistas and visual character along segment 4 would be significant under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios.

Existing Viewpoint 6: Looking East from Beach Park Boulevard and Swordfish Street

Source: BFS Landscape Architects, 2016.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-15
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 6: Looking East from Beach Park Boulevard and Swordfish Street

Existing Viewpoint 7: Looking East from Shorebird Park

Source: BFS Landscape Architects, 2016.

Implementation of the following mitigation measure would help reduce adverse changes to the visual quality and loss of scenic vistas, however, the impact would remain significant and unavoidable because the installation of a sheet pile floodwall would result in a substantial permanent change in the visual quality of the surroundings and block scenic vistas of the bay.

> <u>Mitigation Measure AES-1:</u> During the landscaping/wall enhancement, the floodwall adjacent to Shorebird Park (segment 4) and adjacent to Sea Cloud Park (segment 6) shall be treated with landscaping and/or variations of wall materials. The City of Foster City Public Works Department and/or the project team shall select drought-tolerant plantings compatible with the Foster City Climate Zone vegetation for this landscaping work suitable for the project site and consistent with the aesthetic characteristic of the surrounding area and reflective of existing plantings in the surrounding area. (SU)

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-16
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 7: Looking East from Shorebird Park

Segment 5: Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park

Under the 2050 and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 1.5 feet and 4 feet, respectively. Although views of San Francisco Bay would remain obscured for motorists along Beach Park Boulevard, this is not considered a significant impact because it is assumed that motorists would be focused on the road while driving; thus, only recreationists and residents would be affected. There are no parks along this levee segment. The sheet pile wall would be a maximum of 3.5 feet above the Bay Trail, as previously stated, which would make the view for recreationists and people sitting on benches, only slightly obstructed. Therefore, this impact would be less than significant for recreationists under the 2050 and 2100 Sea Level Rise scenarios.

There are residential 3-story condominiums (Marina Park) along the northern section of the segment along Beach Park Boulevard; however, because these residences are situated approximately 150 feet from the levee and are separated from the levee by a 4-lane road and a median with trees, the existing view of San Francisco Bay at this section is already obscured for residences at the ground floor. Thus, raising the levee would not substantially impact this view. Additional 2- and 3-story residences lie along Wheel House Lane, approximately 50–100 feet from the levee and are separated by a wide median as well as the road (with multiple trees both in the median and the front yards of the residences). Views from the ground floor of these residences would be obstructed by the new sheet pile wall; however, because these are private individual views, this does not constitute a significant impact under CEQA. Viewpoint 8, as seen in Figure V.A-17, shows the view from the end of Wheel House Lane. While the new sheet pile wall would cause minor additional obstruction for recreationists, the impact would be less than significant under the 2050 and 2100 Sea Level Rise scenarios because trail users and people sitting on benches could still see views of the bay over the 3.5-foot wall. The overall impact to scenic vistas and visual character along segment 5 would be less than significant under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios.

Segment 6: Belmont Slough to Gateshead Park

Under the 2050 and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 1.5 feet and 4 feet, respectively. No major roads are adjacent to this segment; thus, only recreationists and residents would be affected.

The sheet pile wall would be a maximum of 3.5 feet higher than the Bay Trail, as previously stated, which would make the view for recreationists along the Bay Trail only slightly obstructed. Sea Cloud Park is at the northeastern end of this segment and Gateshead Park is at the southwestern end; Sea Cloud Park is used for athletic pursuits such as baseball and soccer, while Gateshead Park is primarily defined by its large shade trees. Although the views of Belmont Slough (which would be obstructed by the levee

Existing Viewpoint 8: Looking Northeast from Wheel House Lane

Source: BFS Landscape Architects, 2016.

elevation increase) are not an important characteristic of either park, the Belmont Hills are considered a valued scenic vista and views of these hills would be fully obstructed under the 2100 Sea Level Rise scenario. Viewpoint 9 in Figure V.A-18 shows the proposed views from the Bay Trail south of Sea Cloud Park beyond the southern-most baseball field. Views of the Belmont Hills are only partially obstructed and therefore, the impact along this segment would be less than significant for recreationists under the 2050 Sea Level Rise scenario. However, since views of the Belmont Hills would be fully blocked under the 2100 Sea Level Rise scenario, the impact to scenic vistas and visual quality along this segment would be significant for recreationists.

Implementation of **Mitigation Measure AES-1** would help reduce adverse changes to the visual quality and loss of scenic vistas, however, the impact to visual character and scenic vistas would remain significant and unavoidable because the installation of a sheet pile floodwall would result in a substantial permanent change in the visual quality of the surroundings and block scenic vistas of the Belmont Hills.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-17
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 8: Looking Northeast from Wheel House Lane

Existing Viewpoint 9: Looking South from the Bay Trail near Sea Cloud Park Baseball Field

Source: BFS Landscape Architects, 2016.

There are no residences along the northeastern portion of this segment. The majority of the residences along the southwestern portion of this segment are almost entirely screened from the levee by tall hedges and trees, except for several residences directly northeast of Gateshead Park with direct views of the levee. However, the levee elevation increases in this segment would be relatively minor and private individual views are not considered significant under CEQA.

The overall impact to scenic vistas and visual character along segment 6 would be less than significant under the 2050 Sea Level Rise scenario. Under the 2100 Sea Level Rise scenario the impact to scenic vistas of the Belmont Hills and visual quality, would be significant and unavoidable.

Segment 7: Gateshead Park to Port Royal Park

Under the 2050 and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 0.5–1.5 feet and 3–4 feet, respectively. No major roads are adjacent to this segment; thus, only recreationists and residents would be affected.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-18
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 9: Looking South from the Bay Trail near Sea Cloud Park Baseball Field

The sheet pile wall would be a maximum of 3.5 feet higher than the Bay Trail, as previously stated, and would be only 0.5–1.5 feet tall under the 2050 Sea Level Rise scenario. Therefore, the view for recreationists along the Bay Trail would be only slightly obstructed. No parks are present along this levee segment. The impact along this segment would be less than significant for recreationists under the 2050 and 2100 Sea Level Rise scenarios.

Numerous townhouses and the Schooner Bay apartment complex lie immediately adjacent to this portion of the Bay Trail and enjoy relatively unobstructed views of Belmont Slough and associated wetlands. Almost all of the windows on the slough-facing townhouses are on the second floors, while the first floors are occupied by garages. Therefore, residents on the second floors would retain a view of the slough because their elevation would allow them to see over the sheet pile wall, which would be no more than 3.5 feet tall along this segment. However, impacts to individual private views are not considered a significant impact under CEQA.[7] Viewpoint 10 in Figure V.A-1 shows the proposed view from just north of the residences along Timberhead Lane.

The overall impact to scenic vistas and visual character along segment 7 would be less than significant under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios.

Existing Viewpoint 10: Looking Northeast from Timberhead Lane and the Bay Trail

Source: BFS Landscape Architects, 2016

[7] Association of Bay Area Governments (ABAG), 2014c, op cit.

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-19
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 10: Looking Northeast from Timberhead Lane and the Bay Trail

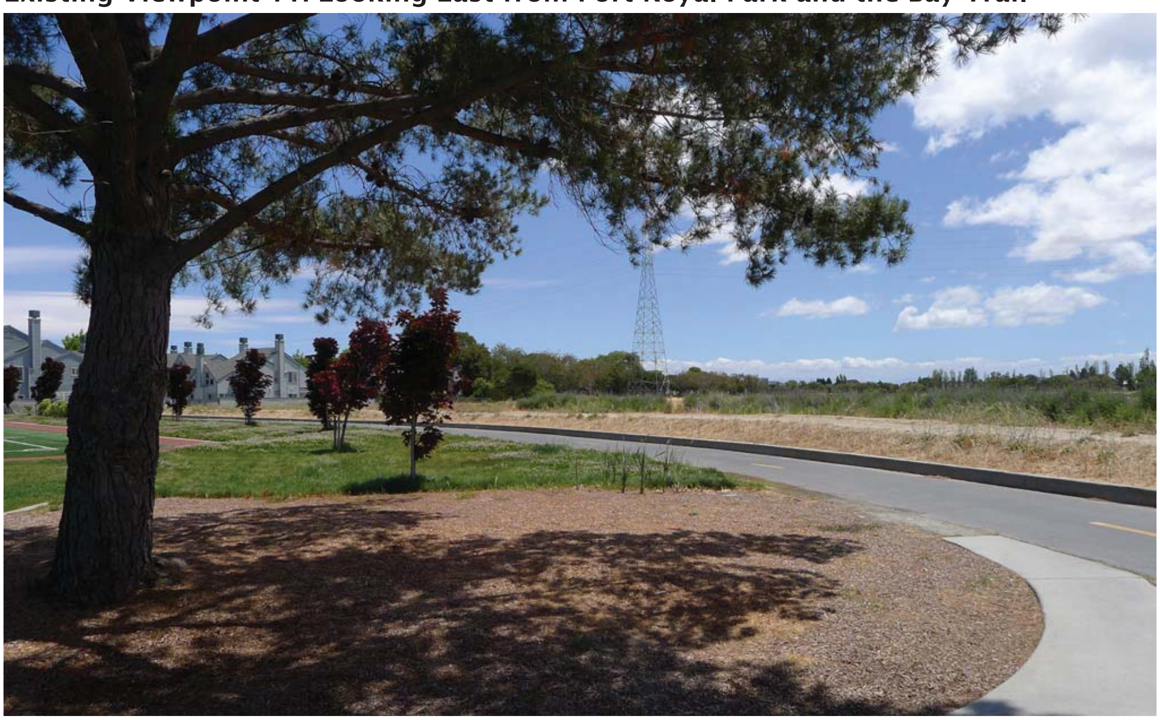
Segment 8: Port Royal Park to Belmont City Limit

Under the 2050 and 2100 Sea Level Rise scenarios, the levee elevation would be raised by approximately 0.5–1.5 feet and 3–4 feet, respectively. No major roads are adjacent to this segment; thus, only recreationists and residents would be affected.

The sheet pile wall would be a maximum of 3.5 feet higher than the Bay Trail, as previously stated. Therefore, the view for recreationists along the Bay Trail would be only slightly obstructed. While Port Royal Park lies adjacent to this segment, the portion next to the levee is a soccer field, and recreationists playing soccer would not typically be concerned about the adjacent views. Therefore, the impact along this segment would be less than significant for recreationists under the 2050 and 2100 Sea Level Rise scenarios. Viewpoint 11 in Figure V.A-20 shows the proposed and existing view from the edge of Port Royal Park.

Along the eastern portion of the segment are townhouses that are separated from the levee/Bay Trail by a fence; these townhouses are immediately adjacent to the levee and are the nearest residences to the levee along the entire 8-mile system. The western

Existing Viewpoint 11: Looking East from Port Royal Park and the Bay Trail



Source: BFS Landscape Architects, 2016

2050 Sea Level Rise Scenario

Source: BFS Landscape Architects, 2016.

2100 Sea Level Rise Scenario

Figure V.A-20
Foster City Levee Protection Planning and Improvements Project EIR
Viewpoint 11: Looking East from Port Royal Park and the Bay Trail

portion of the segment has an adjacent apartment complex, approximately 80–100 feet from the Bay Trail and separated by a planter strip, road, and parking. The view from the eastern townhouses would not be substantially altered because the existing wooden fence is approximately the same height as the proposed sheet pile wall under the 2100 Sea Level Rise scenario and already obscures the residents' view (on the ground floor) to the same extent as would the proposed sheet pile wall. The views from the western apartment complex are at a distance from the levee and are obscured by trees both in the planter strip and in front of the residences. In any event, impacts to individual private views are not generally considered a significant impact under CEQA.

Conclusion

Although the significance determination would vary depending on the segment, the impact to scenic vistas and visual character in segment 4 would be significant and unavoidable under both scenarios (and in segment 6 under the 2100 Sea Level Rise scenario only, as shown below in Table V.A-3, Impact Summary. The levee must be a specific elevation to provide adequate protection to the Foster City shoreline from flooding or from anticipated sea level rise, depending upon the given scenario. Implementation of **Mitigation Measure AES-1** would help reduce adverse changes to the visual quality and loss of scenic vistas, however, the impact would remain significant and unavoidable because the installation of a sheet pile floodwall would result in a substantial permanent change in the visual quality of the surroundings and block scenic vistas of the bay and Belmont Hills.

TABLE V.A-3 IMPACT SUMMARY

Segment	2050 Sea Level Rise Scenario	2100 Sea Level Rise Scenario
1	LTS	LTS
2	LTS	LTS
3	LTS	LTS
4	SU	SU
5	LTS	LTS
6	LTS	SU
7	LTS	LTS
8	LTS	LTS
Overall	SU	SU
Cumulative	SU	SU

Source: Urban Planning Partners, 2016.

d. Cumulative Aesthetics Impacts

Because sea level rise is a global issue, it is expected that other municipalities on the bayside of San Mateo County (and other counties that contain the Bay Trail) would adopt similar measures to protect their shorelines against flooding. Therefore, it is likely that the bayside shoreline of San Mateo County would be irrevocably altered through the erection of floodwall structures, addition of riprap, or other measures yet to be determined. Such measures would likely decrease the aesthetic value of the shoreline, particularly where the Bay Trail lies adjacent to the proposed improvements. Therefore, this cumulative impact would be significant and unavoidable, and the proposed project would make a cumulatively considerable contribution to the significant impact.

B. AIR QUALITY

The U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards to regulate air districts throughout the nation and state and to determine if they are in conformance with the California Clean Air Act (CCAA) and the Federal Clean Air Act (CAA). Air districts are categorized as an "attainment" or a "nonattainment" area according to the number and severity of exceedances of State and Federal ambient air quality standards. The Bay Area Air Quality Management District (BAAQMD) is the regional agency responsible for monitoring air quality levels throughout the nine county San Francisco Bay Area Air Basin (SFBAAB). This section summarizes the current environmental setting and regulatory framework with regard to air quality at the proposed project site (the site), and analyzes the potential air quality impacts resulting from implementation of the project. The impact analysis was conducted following guidance by BAAQMD the analysis identifies both project-level and cumulative environmental impacts, as well as feasible mitigation measures that could reduce the severity of identified impacts, as necessary.

1. Environmental Setting

The project site is located in the SFBAAB and is under the jurisdiction of the BAAQMD. Air quality in the SFBAAB is influenced by the regional climate, meteorology, and topography, in addition to the presence of existing air pollution sources and ambient conditions. The following discussion provides an overview of the environmental setting for air quality in the SFBAAB.

a. Regional Climate, Meteorology, and Topography

The Bay Area has a Mediterranean climate characterized by wet winters and dry summers. During the summer, a high-pressure cell centered over the northeastern Pacific Ocean results in stable meteorological conditions and a steady northwesterly wind flow that keep storms from affecting the California coast. During the winter, the Pacific high-pressure cell weakens, resulting in increased precipitation and the occurrence of storms. The highest air pollutant concentrations in the Bay Area generally occur during inversions, when a surface layer of cooler air becomes trapped beneath a layer of warmer air. An inversion reduces the amount of vertical mixing and dilution of air pollutants in the cooler air near the surface.[1]

Foster City is located within the peninsula region of the SFBAAB, which extends from northwest of San Jose to the Golden Gate. The Santa Cruz Mountains traverse the center of the peninsula, with elevations exceeding 2,000 feet at the southern end, decreasing to

[1] BAAQMD, 2012a. *California Environmental Quality Act Air Quality Guidelines*. May.

500 feet in South San Francisco. Coastal towns experience a high incidence of cool, foggy weather in the summer. Cities in the southeastern peninsula experience warmer temperatures and fewer foggy days because the marine layer is blocked by the ridgeline to the west. San Francisco lies at the northern end of the peninsula. Because most of San Francisco's topography is below 200 feet, marine air is able to flow easily across most of the city, making its climate cool and windy.

The blocking effect of the Santa Cruz Mountains results in variations in summertime maximum temperatures in different parts of the peninsula. For example, in coastal areas and San Francisco, the mean maximum summer temperature is about 65˚F, while in Foster City, the mean maximum summer temperature is about 80˚F. The mean minimum temperature during the winter months is about 40˚F on the eastern side of the Peninsula and on the coast.

Two important gaps in the Santa Cruz Mountains occur on the peninsula. The larger of the two is the San Bruno Gap, extending from Fort Funston on the ocean to San Francisco International Airport. Because the gap is oriented in the same northwest-to-southeast direction as the prevailing winds, and because the elevations along the gap are less than 200 feet, marine air is easily able to penetrate into San Francisco Bay. The other gap is the Crystal Springs Gap, between Half Moon Bay and San Carlos. As the sea breeze strengthens on summer afternoons, the gap permits maritime air to pass across the mountains, and its cooling effect is commonly seen in Foster City.

Annual average wind speeds range from 5 to 10 miles per hour throughout the peninsula, with higher wind speeds usually found along the coast. Winds on the eastern side of the peninsula are often high in certain areas, such as near the San Bruno Gap and the Crystal Springs Gap.

The prevailing winds along the peninsula's coast are from the west, although individual sites can show significant differences. For example, Fort Funston in western San Francisco shows a southwest wind pattern, while Pillar Point in San Mateo County shows a northwest wind pattern. On the east side of the mountains, winds are generally from the west, although wind patterns in this area are often influenced greatly by local topographic features.

Air pollution potential is highest along the southeastern portion of the peninsula. This is the area most protected from the high winds and fog of the marine layer. Pollutant transport from upwind sites is common. In the southeastern portion of the peninsula, air pollutant emissions are relatively high due to motor vehicle traffic as well as stationary sources. At the northern end of the peninsula in San Francisco, pollutant emissions are high, especially from motor vehicle congestion. Localized pollutants, such as carbon monoxide (CO), can build up in "urban canyons." Wind speeds are generally high enough to carry the pollutants away before they can accumulate.

b. Regional Air Pollutants of Concern

The California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) currently focus on the following six air pollutants as indicators of ambient air quality: ozone, particulate matter, nitrogen dioxide (NO_2), CO, sulfur dioxide (SO_2), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and about which extensive health-effects criteria documents are available, they are referred to as "criteria air pollutants."

In the SFBAAB, the primary criteria air pollutants of concern are CO, ground-level ozone formed through reactions of oxides of nitrogen (NOx) and reactive organic gases (ROGs), and suspended particulate matter (i.e., respirable particulate matter, less than 10 microns in diameter [PM_{10}], and fine particulate matter, less than 2.5 microns in diameter [$PM_{2.5}$]). In addition to criteria air pollutants, local emissions of toxic air contaminants (TACs) are a concern for nearby receptors. These air pollutants of concern are discussed further below.

(1) Carbon Monoxide

CO is a colorless, odorless gas produced by the incomplete combustion of fuels; the primary source of CO in the SFBAAB is motor vehicles. CO impacts are generally localized because CO disperses rapidly as distance increases from the source; high concentrations can be a concern in areas with heavy traffic congestion. CO concentrations tend to be the highest during winter mornings with little to no wind, when surface-based inversions trap the pollutant at ground levels. The highest ambient CO concentrations are generally found near highly congested transportation corridors and intersections. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia, and for fetuses. CO can affect healthy people as well, with exposures to high concentrations of CO causing headaches, dizziness, fatigue, unconsciousness, and even death.

(2) Ozone

While ozone serves a beneficial purpose in the upper atmosphere (stratosphere) by reducing ultraviolet radiation potentially harmful to humans, it can be harmful to the human respiratory system and to sensitive species of plants when it reaches elevated concentrations in the lower atmosphere. Ozone is not emitted directly into the environment, but is formed in the atmosphere by complex chemical reactions between ROG and NOx in the presence of sunlight. Ozone formation is greatest during periods of little or no wind, bright sunshine, and high temperatures. As a result, levels of ozone usually build up during the day and peak in the afternoon hours.

Sources of ROG and NOx include vehicle tailpipe emissions; evaporation of solvents, paints, and fuels; and biogenic substances.[2] Automobiles are the single largest source of ozone precursors in the SFBAAB. Short-term ozone exposure can reduce lung function in children, make persons susceptible to respiratory infection, and produce symptoms that cause people to seek medical treatment for respiratory distress. Long-term exposure can impair lung defense mechanisms and lead to emphysema and chronic bronchitis. Ozone can also damage plants and trees and materials such as rubber and fabrics.

(3) Particulate Matter

PM_{10} and $PM_{2.5}$ consist of extremely small suspended particles or droplets that are 10 microns and 2.5 microns or smaller in diameter, respectively. Some sources of particulate matter, like pollen, forest fires, and windblown dust, are naturally occurring. In populated areas, however, most particulate matter is caused by road dust, combustion products, abrasion of tires and brakes, and construction activities. Particulate matter can also be formed in the atmosphere by condensation of SO_2 and ROG.

Particulate matter exposure can affect breathing, aggravate existing respiratory and cardiovascular disease, alter the body's defense systems against foreign materials, and damage lung tissue, contributing to cancer and premature death. Individuals with chronic obstructive pulmonary or cardiovascular disease, asthmatics, the elderly, and children are most sensitive to the effects of particulate matter.

(4) Toxic Air Contaminants

TACs include a diverse group of air pollutants that can adversely affect human health. Unlike criteria pollutants, which are regionally regulated based on the State of California Ambient Air Quality Standards (CAAQSs), TAC emissions are evaluated based on estimations of localized concentrations and risk assessments. The adverse health effects a person may experience following exposure to any chemical depend on several factors, including the amount to which one is exposed (dose), the duration of exposure, the form of the chemical, and if exposure to any other chemicals has occurred.

For risk assessment purposes, TACs are separated into carcinogens and noncarcinogens. Carcinogens are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per 1 million exposed individuals over a lifetime of exposure. Noncarcinogenic substances are generally

[2] Biogenic sources include volatile organic compounds (which include ROG) from the decomposition of vegetative matter and certain plants, such as oak and pine trees.

assumed to have a safe threshold below which health impacts would not occur. Acute and chronic exposure to noncarcinogens is expressed as a hazard index (HI), which is the sum of expected exposure levels divided by the corresponding acceptable exposure levels. In the SFBAAB, adverse air quality impacts to public health from TACs are predominantly from diesel particulate matter (DPM).[3]

DPM is generated when an engine burns diesel fuel. It consists of a mixture of gases and fine particles (also known as soot) that can penetrate deeply into the lungs, where it can contribute to a range of health problems. In 1998, the CARB identified particulate matter from diesel-powered engines as a TAC based on its potential to cause cancer and other adverse health effects.[4]

c. Existing Sensitive Receptors

The term "sensitive receptor" refers to a location where individuals are more susceptible to poor air quality. Sensitive receptors include schools, convalescent homes, and hospitals because the very young, the old, and the infirm are more susceptible to air-quality-related health problems than is the rest of the public. Residential areas are also considered sensitive to poor air quality because people are often at home for extended periods, thereby increasing the duration of exposure to potential air contaminants. The closest sensitive receptors to the maximum project footprint (2100 Sea Level Rise scenario) are residences. As summarized in Table V.B-1, residential receptors are located within 100 feet of levee segments 3 through 8.

d. Odors

Other air quality issues of concern in the SFBAAB include nuisance impacts from odors. Objectionable odors may be associated with a variety of pollutants. Common sources of odors include wastewater treatment plants, landfills, composting facilities, refineries, and chemical plants. Odors rarely have direct health impacts, but they can be very unpleasant and can lead to controversy and/or concern over possible health effects among the public. Each year, the BAAQMD receives thousands of citizen complaints about objectionable odors.

2. Regulatory Framework

The federal, state, and local regulations related to air quality that are relevant to the proposed project are described below.

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[3] BAAQMD, 2010. *Bay Area 2010 Clean Air Plan*. September 15.

[4] CARB, 1998. Initial Statement of Reasons for Rulemaking. Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant. June.

TABLE V.B-1 DISTANCES TO CLOSEST RESIDENTIAL RECEPTORS

Project Location	Distance to Residential Receptor (in feet)
Segment 1	550
Segment 2	765
Segment 3	85
Segment 4	80
Segment 5	25
Segment 6	20
Segment 7	55
Segment 8	10

Note: Distances are approximate relative to the footprint of the 2100 Sea Level Rise scenario, which is analyzed below in the Impact discussion as the "worst-case" scenario.

a. Federal and State Regulations

The U.S. EPA is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the National Ambient Air Quality Standards (NAAQSs) and judging the adequacy of State Implementation Plans (SIPs). The CARB is responsible for establishing and reviewing the CAAQSs, developing and managing the California SIP, identifying TACs, and overseeing the activities of regional air quality management districts. In California, mobile emissions sources (e.g., construction equipment, trucks, and automobiles) are regulated by the CARB, and stationary emissions sources (e.g., industrial facilities) are regulated by the air quality management districts.

The CAAQSs and NAAQSs, which were developed for criteria air pollutants, are intended to incorporate an adequate margin of safety to protect the public health and welfare. California has also established CAAQSs for sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. To achieve CAAQSs, criteria air pollutant emissions in California are managed through control measures described in regional air quality plans and emission limitations placed on permitted stationary sources.

In accordance with both the federal Clean Air Act and California Clean Air Act, areas in California are classified as either in "attainment", "maintenance", or "nonattainment" of the NAAQSs or CAAQSs for each criteria air pollutant. To assess the regional attainment status, the BAAQMD collects ambient air quality data from over 30 monitoring sites within the SFBAAB. Based on the monitoring data collected, the SFBAAB is currently designated as

TABLE V.B-2 AMBIENT AIR QUALITY STANDARDS AND ATTAINMENT STATUS

		CAAQSs		NAAQSs	
Pollutant	**Averaging Time**	**Concentration**	**Attainment Status**	**Concentration**	**Attainment Status**
Ozone	8-Hour	0.070 ppm (137 μg/m³)	N	0.075 ppm	N
	1-Hour	0.09 ppm (180 μg/m³)	N	Revoked by EPA 2005	---
CO	8-Hour	9.0 ppm (10 mg/m³)	A	9 ppm (10 mg/m³)	A
	1-Hour	20 ppm (23 mg/m³)	A	35 ppm (40 mg/m³)	A
NO_2	1-Hour	0.18 ppm (339 μg/m³)	A	0.100 ppm	U
	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	A	0.053 ppm (100 μg/m³)	A
SO_2	24-Hour	0.04 ppm (105 μg/m³)	A	0.14 ppm (365 μg/m³)	A
	1-Hour	0.25 ppm (655 μg/m³)	A	0.075 ppm (196 μg/m³)	A
	Annual Arithmetic Mean	---	---	0.030 ppm (80 μg/m³)	A
PM_{10}	Annual Arithmetic Mean	20 μg/m³	N	---	---
	24-Hour	50 μg/m³	N	150 μg/m³	U
$PM_{2.5}$	Annual Arithmetic Mean	12 μg/m³	N	12 μg/m³	U/A
	24-Hour	---	---	35 μg/m³	N
Sulfates	24-Hour	25 μg/m³	A	---	---
Lead	30-Day Average	1.5 μg/m³	A	---	---
	Calendar Quarter	---	---	1.5 μg/m³	A
	Rolling 3-Month Average	---	---	0.15 μg/m³	A
Hydrogen Sulfide	1-Hour	0.03 ppm (42 μg/m³)	U	---	---
Vinyl Chloride	24-Hour	0.010 ppm (26 μg/m³)	No information available	---	---
Visibility Reducing Particles	8 Hour (10:00 to 18:00 PST)	---	U	---	---

Notes: A=Attainment; N=Nonattainment; U=Unclassified; "---"=Not Applicable; mg/m³=milligrams per cubic meter; ppm=parts per million; μg/m³=micrograms per cubic meter.
Source: BAAQMD, 2016. *Air Quality Standards and Attainment Status*. http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status, accessed June 1, 2016.

a nonattainment area for ozone, PM_{10}, and $PM_{2.5}$, and is designated an attainment or unclassified area for all other pollutants (Table V.B-2).

b. Bay Area Air Quality Management District

The BAAQMD is primarily responsible for ensuring that the NAAQSs and CAAQSs are attained and maintained in the SFBAAB. The BAAQMD fulfills this responsibility by adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits, inspecting stationary sources of air pollutants, responding to citizen complaints, and monitoring ambient air quality and meteorological conditions. The BAAQMD also awards grants to reduce motor vehicle emissions, conducts public education campaigns, and engages in many other activities associated with improving air quality within the SFBAAB.

In June 2010, the BAAQMD adopted thresholds of significance to assist lead agencies in the evaluation and mitigation of air quality impacts under CEQA. The BAAQMD's thresholds, which were incorporated into the 2011 *CEQA Air Quality Guidelines*,[5] established levels at which emissions of ozone precursors (ROG and NOx), PM_{10}, $PM_{2.5}$, local CO, and TACs would cause significant air quality impacts.

The 2011 *CEQA Air Quality Guidelines* were subsequently challenged, and the Alameda County Superior Court ordered the BAAQMD to set aside its recommended thresholds of significance until it complied with CEQA requirements. In view of the court's order, the BAAQMD updated the *CEQA Air Quality Guidelines* in 2012 to exclude the recommended thresholds of significance. However, because the adoption process and scientific soundness of the thresholds have not been challenged, the BAAQMD's thresholds of significance were used in conjunction with the updated 2012 *CEQA Air Quality Guidelines*[6] to analyze air quality impacts for the proposed project.

c. Bay Area Clean Air Plan

In accordance with the California Clean Air Act, the BAAQMD is required to prepare and update an air quality plan that outlines measures by which both stationary and mobile sources of pollutants can be controlled in order to achieve NAAQSs and CAAQSs in areas designated as nonattainment. In September 2010, the BAAQMD adopted the *Bay Area 2010 Clean Air Plan* (CAP),[7] which serves as an update to the previous *Bay Area 2005 Ozone Strategy*.[8] The 2010 CAP includes 55 control measures to reduce ozone precursors, particulate matter, TACs, and greenhouse gases. The 2010 CAP was developed based on

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[5] BAAQMD, 2011. *California Environmental Quality Act Air Quality Guidelines*. May.
[6] BAAQMD, 2012a, op. cit.
[7] BAAQMD, 2010, op. cit.
[8] BAAQMD, 2006. *Bay Area 2005 Ozone Strategy*. January 6.

computer modeling and analysis of existing air quality monitoring data and emissions inventories, and incorporated traffic and population growth projections prepared by the Metropolitan Transportation Commission and the Association of Bay Area Government, respectively.

d. Local Regulations

Applicable local regulations related to air quality are described below.

(1) Foster City General Plan

The adopted City of Foster City General Plan identifies the following policies and programs related to air quality within Chapter 8, Conservation Element (adopted in 2003) that are relevant to the proposed project:

Conservation Policies

> *C-3: Air Quality.* Reduce the impact of development on local air quality.

Conservation Programs

> *C-j: Air Quality Impacts*. Review proposed projects for their potential to affect air quality conditions.
> Responsibility: Community Development Department.
> Timeline: During Plan Review
>
> *C-n: Coordination with Other Agencies in Air Quality Improvements.* Coordinate review of large projects with local, regional and state agencies to improve air quality.
> Responsibility: Community Development Department.
> Timeline: During Plan Review

3. Impacts and Mitigation Measures

This subsection discusses the potential impacts on air quality that could result from implementation of the proposed project. Included are (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the air quality impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on air quality if it would:

- Conflict with or obstruct implementation of the applicable air quality plan(s);

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The significance criteria were evaluated based on the BAAQMD's thresholds of significance[9] and 2012 *CEQA Air Quality Guidelines*.[10]

b. Less-Than-Significant Air Quality Impacts

Implementation of the proposed project would result in the less-than-significant impacts described below. Because these impacts would not exceed the significance criteria described above, they do not require mitigation measures.

(1) Conflict with an Air Quality Plan

The current and applicable air quality plan is the 2010 CAP. Based on the current 2012 *CEQA Air Quality Guidelines*, the following criteria should be considered to determine if a project would conflict with or obstruct implementation of the 2010 CAP:

- Does the project include applicable control measures from the air quality plan?
- Does the project disrupt or hinder implementation of any air quality plan control measures?
- Does the project support the primary goals of the air quality plan?

The 2010 CAP includes 55 control measures that aim to reduce air pollution from stationary, area, and mobile sources. The control measures are organized into five categories: stationary source measures, mobile source measures, transportation control measures, land use and local impact measures, and energy and climate measures (each of which are described below in more detail). The project's consistency with each control measure group is described below.

- Stationary source measures are enforced by the BAAQMD pursuant to its authority to control emissions from permitted facilities. The project would not generate any point-source pollutant emissions subject to BAAQMD permit restrictions. Because the project

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[9] BAAQMD, 2011, op. cit.
[10] BAAQMD, 2012a, op. cit.

would not be a permitted BAAQMD facility, the stationary source measures are not applicable to the project.

- Mobile source measures are generally statewide programs implemented by the CARB that aim to reduce vehicle emissions by accelerating the replacement of older vehicles and equipment. Consistent with the mobile source measures, heavy-duty diesel vehicles used to haul soil during project construction would be required to comply with the CARB's In-Use Off-Road Diesel Vehicle Regulation.
- Transportation control measures are strategies to reduce vehicle trips, use, miles traveled, idling, or traffic congestion for the purpose of reducing vehicle emissions. Because the project would not generate a long-term increase in vehicle trips, the transportation control measures are not applicable to the project.
- Land use and local impact measures are designed to (1) promote mixed-use compact development to reduce motor vehicle travel and emissions; and (2) ensure that growth is planned in a way that protects people from exposure to air pollution from stationary and mobile sources of emissions. Because the project would not result in a population increase, the land use and local impact measures are not applicable to the project.
- Energy and climate measures are designed to reduce ambient concentrations of criteria pollutants, reduce emissions of CO_2, and protect the climate by promoting energy conservation, renewable energy production, reductions in "urban heat island" effects, and plantings of trees with low emissions of volatile organic compounds. Because the project's pollutant emissions would be temporary, the energy and climate measure are not applicable to the project.

As described above, project construction would comply with applicable control measures. Because no traffic or population growth is associated with the project, project construction activities would not be expected to hinder or disrupt implementation of the 2010 CAP.

The goals of the 2010 CAP are to reduce the emissions and ambient concentrations of ROG, NOX, PM_{10}, $PM_{2.5}$, TACs, and greenhouse gases, and to reduce public exposure to harmful pollutants. Because the project would not result in any significant and unavoidable air quality impact-related emissions, ambient concentrations, or public exposures, the project supports the primary goals of the 2010 CAP. According to the 2012 *CEQA Air Quality Guidelines*, project construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would have a less-than-significant impact on the implementation of the applicable air quality plan.

(2) Air Quality Standards – Project Operation

Once construction is complete, operation of the project would not result in any significant impacts. The operation of the project would not substantially increase vehicle trips related to operations or maintenance and therefore any impacts related to increases in emissions during operation would be less than significant.

(3) Exposure of Sensitive Receptors to TACs

The BAAQMD recommends evaluating the potential impacts of project TAC emissions to sensitive receptors located within 1,000 feet of the project. Based on the BAAQMD's thresholds, under project conditions, significant impacts to sensitive receptors from TAC emissions include a cancer risk level greater than 10 in 1 million, an acute or chronic non-cancer HI greater than 1.0, or an ambient $PM_{2.5}$ concentration greater than an annual average of 0.3 microgram per cubic meter ($\mu g/m^3$). Under cumulative conditions, significant impacts to sensitive receptors include a cancer risk level greater than 100 in 1 million, an acute or chronic HI greater than 10.0, or an ambient $PM_{2.5}$ concentration greater than an annual average of 0.8 $\mu g/m^3$.

TAC emissions during project construction would primarily be DPM from off-road construction equipment and trucks hauling soil to the staging areas. The closest sensitive receptors to the project are residential homes located within 100 feet of levee segments 3–8.

In accordance with the Office of Environmental Health Hazard Assessment (OEHHA),[11] concentrations of PM_{10} were used as a basis for calculating health risks associated with DPM. The annual average concentrations of DPM and $PM_{2.5}$ concentrations were estimated within 1,000 feet of the project footprint for the maximum development scenario (2100 Sea Level Rise scenario) using the U.S. EPA's Industrial Source Complex Short Term (ISCST3) air dispersion model. The input parameters and assumptions used for estimating emission rates from off-road equipment and haul trucks are included in Appendix B.

The dispersion of DPM emissions from haul trucks traveling to the project staging areas was performed in accordance with BAAQMD guidance.[12] Because the BAAQMD does not have guidance for modeling the dispersion of DPM emissions from off-road construction equipment, dispersion modeling of off-road equipment was performed in accordance with guidance from the Sacramento Metropolitan Air Quality Management District.[13] Daily emissions from off-road construction equipment were assumed to occur over a 9-hour period between 8:00 a.m. and 5:00 p.m. between Monday and Friday, and emissions from haul trucks were assumed to occur over a 7-hour period between 9:00 a.m. and 4:00 p.m. between Monday and Saturday.

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[11] Office of Environmental Health Hazard Assessment (OEHHA), 2015. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. February.

[12] BAAQMD, 2012b. *Recommended Methods for Screening and Modeling Local Risks and Hazards*. May.

[13] Sacramento Metropolitan Air Quality Management District, 2015. *Guide to Air Quality Assessment in Sacramento County*. June.

A uniform grid of receptors spaced 100 to 500 meters (328 to 1,640 feet) apart, with receptor heights of 1.5 meters (4.9 feet), was placed around the project as a means of developing isopleths (i.e., concentration contours) that illustrate the dispersion pattern of the source emissions. A refined grid of receptors spaced 10 meters (32.8 feet) apart was placed over residential areas within 50 meters of the project. The ISCST3 model input parameters included 1 year of BAAQMD meteorological data from the San Mateo station located about 2,000 feet west of levee segment 1. The input parameters, assumptions, and results of the ISCST3 model are included in Appendix B.

In accordance with guidance from both the BAAQMD[14] and OEHHA,[15] an HRA was conducted to calculate the incremental increase in cancer risk and chronic HI to sensitive receptors from DPM emissions during construction. The acute HI for DPM was not calculated because an acute reference exposure level has not been approved by OEHHA and the CARB, and the BAAQMD does not recommend analysis of acute non-cancer health hazards from construction activity. The annual average concentration of DPM at the maximally exposed individual resident (MEIR) location was used to conservatively assess potential health risks to nearby sensitive receptors.

The incremental increase in cancer risk from DPM emissions during construction was assessed for a child exposed to DPM at the MEIR location beginning from the third trimester of pregnancy until about the age of two. This exposure scenario represents the most sensitive individual who could be exposed to adverse air quality conditions in the vicinity of the project. While the duration of construction activities along each segment would range from about 60 to 275 days, it was assumed that the MEIR would be exposed to an annual average DPM concentration over the entire estimated duration of construction, which is about 2 years for the shortest (and most intense) construction schedule anticipated under the 2100 Sea Level Rise scenario. Since longer and less intense construction schedules would result in lower daily emissions of DPM, the estimated health risks would generally be the same regardless of the implemented schedule. The input parameters and results of the HRA are included in Appendix B.

Estimates of the health risks to the MEIR posed by DPM and $PM_{2.5}$ emissions under construction of the 2100 Sea Level Rise scenario are summarized and compared to the BAAQMD's thresholds of significance in Table V.B-3. The estimated excess cancer risk and HI for DPM and annual average $PM_{2.5}$ concentration from unmitigated construction emissions associated with the potentially most impactful scenario (2100 Sea Level Rise) were below the BAAQMD's thresholds; therefore, TAC emissions during project

[14] BAAQMD, 2012b, op. cit.
[15] OEHHA, 2015, op. cit.

TABLE V.B-3 HEALTH RISKS TO MEIR FROM TAC EMISSIONS DURING PROJECT CONSTRUCTION

	Diesel Particulate Matter		Exhaust $PM_{2.5}$
Emissions Scenario	Cancer Risk (per million)	Chronic Hazard Index	Annual Average Concentration ($\mu g/m^3$)
Maximally Exposed Individual Resident	7.1[a]	<0.01	0.02
BAAQMD's Thresholds of Significance	10	1.0	0.3
Thresholds Exceedance?	No	No	No

[a] This value is based on conservative assumptions and almost certainly over-estimates the risk.
Notes: $\mu g/m^3$ = micrograms per cubic meter
Assumes unmitigated construction emissions from off-road equipment are equivalent to the U.S. EPA's Tier 2 emission standards.
Source: See Appendix B.

construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would pose a less-than-significant impact to nearby sensitive receptors.

(4) Create Objectionable Odors

Project construction activities associated with levee improvements for the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would not be expected to generate significant odors because the construction activities would not include handling or generation of noxious materials. Therefore, project impacts related to odors would be less than significant.

c. Significant Air Quality Impacts and Mitigation Measures

The proposed project would result in three significant air quality impacts, two project and one cumulative, as discussed below.

(1) Air Quality Standards – Fugitive Dust Emissions During Construction

Pollutant emissions of concern during project construction include PM_{10} and $PM_{2.5}$ from fugitive dust generated during earth-moving activities. Emissions generated from exhaust of off-road equipment and on-road vehicles are discussed below under Impact AIR-2.

Impact AIR-1: Fugitive dust emissions generated during project construction may result in significant air quality impacts. (S)

The primary sources of fugitive dust PM_{10} and $PM_{2.5}$ emissions during project construction include soil disturbance, grading, and material hauling activities. The BAAQMD does not have a quantitative threshold of significance for fugitive dust PM_{10} and $PM_{2.5}$ emissions; however, the BAAQMD considers implementation of dust control measures during construction sufficient to reduce air quality impacts from fugitive dust to a less-than-significant level. Therefore, implementation of Mitigation Measure AIR-1 would reduce potentially significant impacts to existing air quality standards from fugitive dust emissions during project construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios to a less-than-significant level.

Mitigation Measure AIR-1: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement all dust control requirements. The following controls shall be implemented at all construction sites and staging areas within the project to control dust production and fugitive dust.

a. Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing sensitive land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers to control dust;

b. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard;

c. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites;

d. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas at construction sites;

e. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;

f. Blowing dust shall be reduced by timing construction activities so that paving and building construction begin as soon as possible after completion of grading, and by landscaping disturbed soils as soon as possible;

g. Water trucks shall be present and in use at the construction site;

h. All portions of the site subject to blowing dust shall be watered as often as deemed necessary by the City in order to insure proper control of blowing dust for the duration of the project;

i. Watering on public streets shall not occur;

j. All vehicle speeds on unpaved roads shall be limited to 15 mph;

k. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used;

l. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes, as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations (CCR). Clear signage shall be provided for construction workers at all access points;

m. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator;

n. Streets will be cleaned by street sweepers or by hand as often as deemed necessary by the City Engineer;

o. Watering associated with on-site construction activity shall take place between the hours of 8 a.m. and 7 p.m. and shall include at least one late-afternoon watering to minimize the effects of blowing dust;

p. All public streets and medians soiled or littered due to this construction activity shall be cleaned and swept on a daily basis during the workweek to the satisfaction of the City; and

q. Post a publicly visible sign with the telephone number and person to contact regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations. (LTS)

(2) Air Quality Standards – Exhaust Emissions during Project Construction

Pollutant emissions of concern during project construction include ROG, NOX, PM_{10}, and $PM_{2.5}$ generated from the exhaust of off-road equipment and on-road vehicles. To determine if construction emissions could substantially contribute to existing violations of CAAQSs and/or NAAQSs in the SFBAAB, the project's projected exhaust emissions are compared to the BAAQMD's thresholds of significance, below.

<u>Impact AIR-2</u>: Exhaust emissions generated during project construction may result in significant air quality impacts. (S)

Project emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ during construction were estimated from off-road equipment and on-road vehicles for the 2050 Sea Level Rise and 2100 Sea Level Rise[16] scenarios. To estimate unmitigated construction emissions, it was assumed that all off-road equipment would be equipped with diesel engines certified to meet the U.S. EPA's Tier 2 emission standards (which generally reflects the current composition of typical fleets). The type of equipment and vehicles that would be used during project construction activities are summarized in Tables V.B-4 and V.B-5, respectively, and additional details are included in Appendix B. Construction was assumed to begin in 2018

[16] For the purposes of the air quality analysis, the 2050 Sea Level Rise scenario was considered to have similar emissions.

TABLE V.B-4 OFF-ROAD EQUIPMENT LIST

		2050 Sea Level Rise Scenario		2100 Sea Level Rise Scenario	
Equipment	**Construction Activity**	**Quantity**	**Work Days**	**Quantity**	**Work Days**
Excavator	Activity 1: Sheet Piling	2	230	2	290
Crane	Activity 1: Sheet Piling	2	230	2	290
Generator	Activity 1: Sheet Piling	2	230	2	290
Vibratory Hammer/ Giken Press	Activity 1: Sheet Piling	2	230	2	290
Rubber Tired Dozer	Activity 1: Sheet Piling	2	230	2	290
Rubber Tired Loader	Activity 1: Sheet Piling	2	230	2	290
Grader	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Rubber Tired Dozer	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Rubber Tired Loader	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Water Truck	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Tandem Roller	Activity e 2: Levee Fill and Trail Reconstruct	1	150	2	245
Pneumatic Roller	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Sheepsfoot Roller	Activity 2: Levee Fill and Trail Reconstruct	1	150	2	245
Dump Truck (10 ton)	Activity 2: Levee Fill and Trail Reconstruct	3	150	3	245
Paver	Activity 2: Levee Fill and Trail Reconstruct	1	30	1	40
Truck Tractor	Activity 2: Levee Fill and Trail Reconstruct	1	30	1	40
Skid Steer	Activity 3: Landscaping	3	95	3	190
Hydromulcher	Activity 3: Landscaping	1	10	1	10
Truck Tractor	Activity 3: Landscaping	1	10	1	10

Source: Information based on written communication between Schaaf & Wheeler and BASELINE Environmental Consulting, 2016.

TABLE V.B-5 ON-ROAD VEHICLE LIST

		2050 Sea Level Rise Scenario		2100 Sea Level Rise Scenario	
Vehicle	**Construction Activity**	**Quantity**	**Round Trips per Vehicle**	**Quantity**	**Round Trips per Vehicle**
Worker Vehicle	Activity 1: Sheet Piling	16	230	8	290
Vendor 20-Ton Flatbed Truck	Activity 1: Sheet Piling	1	338	1	980
Worker Vehicle	Activity 2: Levee Fill and Trail Reconstruct	12	150	12	245
Hauler 20-Ton Dump Truck	Activity 2: Levee Fill and Trail Reconstruct	3	1,278	3	4,084
Worker Vehicle	Activity 3: Landscaping	12	95	6	190

Sources: Information based on written communication between Schaaf & Wheeler, Fehr & Peers, and BASELINE Environmental Consulting, 2016.

and last for at least 391 and 521 work days for the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, respectively.

Emissions from off-road diesel equipment were estimated in accordance with methodologies presented in the CARB's (2010) *Off-road Simulation Model and Summary of Off-Road Emissions Inventory Update* and using data derived from the CARB's *Off-Road Emissions Inventory Model* (OFFROAD2011) and *California Emissions Estimator Model* (CalEEMod). The input parameters and assumptions used to estimate emissions from off-road equipment are included in Appendix B. The total ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ emissions from each type of off-road equipment were calculated using the following equation:

$$\text{Emissions in pounds } = (Pop)(HP_{Ave})(LF)(Hr)(EF)\left(\frac{1\,pound}{454\,grams}\right)$$

Where:

Pop = Population of equipment
HP_{Ave} = Maximum-rated average horse power (hp)
LF = Load factor
Hr = total operating hours (per equipment)
EF = Emissions factor (grams/hp-hour)

Emissions from on-road vehicles were estimated using data derived the *CARB's EMission FACtors Model* (EMFAC2014) and CalEEMod. The input parameters and assumptions used to estimate emissions from on-road vehicles are included in Appendix B. The total ROG, NOx, and exhaust PM_{10} and $PM_{2.5}$ emissions from each type of on-road vehicle were calculated using the following equation:

$$\text{Emissions in pounds } = (Pop)(VMT)(EF)\left(\frac{1\ pound}{454\ grams}\right)$$

Where:

Pop = Population of equipment
VMT = Vehicle miles traveled (per equipment)
EF = Emissions factor (grams/VMT)

As show in in Table V.B-6, the estimated unmitigated daily emissions of ROG and exhaust PM_{10} and $PM_{2.5}$ from project construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would not exceed the BAAQMD's thresholds of significance; however, since the daily emissions of NOx would exceed the threshold, project construction emissions would result in a potentially significant impact.

As shown in Table V.B-6, the use of off-road equipment with engines certified to meet the U.S. EPA's Tier 3 emission standards would reduce total NOx emissions by at least 40 percent. Based on the shortest (and most intense) anticipated construction schedules for each build scenario (1.5 years for the 2050 Sea Level Rise scenario and 2 years for the 2100 Sea Level Rise scenario), the use of Tier 3 engines would reduce daily NOx emissions below the BAAQMD's threshold of significance.

If the construction schedule varies from that reflected in this analysis (specifically if the schedule was accelerated and more work was done in a shorter time period), the daily construction emissions would be expected to increase and the use of Tier 3 engines may not be sufficient to reduce daily NOx emissions below the BAAQMD's threshold of significance (particularly for the 2100 Sea Level Rise scenario). As shown in Table V.B-6, the use of off-road equipment with engines certified to meet the U.S. EPA's Tier 4 emission standards would reduce total NOx emissions by at least 85 percent. If Tier 4 engines were used, the project schedules for the 2050 Sea Level Rise and 2100 Seal Level Rise scenarios could hypothetically be reduced by up to 75 percent before NOx levels would potentially exceed the BAAQMD's threshold of significance. However, any potential reductions in the construction schedule for either build scenario would be substantially less than 75 percent (i.e., it would not be possible to complete the levee improvements in 75 percent less time than currently estimated). Implementation of Mitigation Measure AIR-2 would reduce potentially significant impacts to existing air quality standards from exhaust emissions during project construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios to a less-than-significant level.

TABLE V.B-6 UNMITIGATED CRITERIA POLLUTANT EMISSIONS DURING CONSTRUCTION

Emissions Scenario		ROG	NOx	Exhaust PM_{10}	Exhaust $PM_{2.5}$
	Units	lb/day	lb/day	lb/day	lb/day
2050 Sea Level Rise Scenario					
Unmitigated Emissions (Tier 2 engines)[a]		2.4	**67**	1.8	1.8
Mitigated Emissions (Tier 3 engines)[b]		2.0	40	1.7	1.7
Mitigated Emissions (Tier 4 engines)[c]		1.1	8.0	0.2	0.2
2100 Sea Level Rise Scenario					
Unmitigated Emissions (Tier 2 engines)[a]		3.1	**88**	2.3	2.3
Mitigated Emissions (Tier 3 engines)[b]		2.5	53	2.2	2.2
Mitigated Emissions (Tier 4 engines)[c]		1.4	13	0.3	0.3
BAAQMD's Thresholds of Significance		54	54	82	54

Notes: lb/day = pounds per day (based on total emissions averaged over the shortest anticipated number of work days)
Bold and shaded font indicates an exceedance of the BAAQMD's threshold of significance.
[a] Assumes unmitigated emissions from off-road equipment are equivalent to the U.S. EPA's Tier 2 emission standards.
[b] Assumes mitigated emissions from off-road equipment are equivalent to the U.S. EPA's Tier 3 emission standards.
[c] Assumes mitigated emissions from off-road equipment are equivalent to the U.S. EPA's Tier 4 emission standards.
Source: See Appendix B.

<u>Mitigation Measure AIR-2</u>: The City of Foster City Public Works Department and/or the project team shall require the project contractor to comply with the following exhaust control requirements:

a. If the project schedule is not reduced below current estimates, then the project contractor shall ensure that all off-road construction equipment with a 25 horsepower or greater diesel engine meets the U.S. EPA's Tier 3 or higher emission standards.

b. If the project schedule is reduced below current estimates, then the project contractor shall ensure that all off-road construction equipment with a 25 horsepower or greater diesel engine meets the U.S. EPA's Tier 4 emission standards.

c. The contractor shall submit to the City of Foster City Public Works Department and/or the project team a list of off-road construction equipment to be used on the project with the following information: equipment type and manufacturer;

equipment identification number (required by CARB); year of engine manufacture; and engine Tier rating.

d. The contractor shall also submit to the City of Foster City Public Works Department and/or the project team a Certification Statement that the contractor agrees to comply fully with the applicable Tier 3 or higher emission standards, as described above, for all off-road diesel equipment and acknowledges that a significant violation of this measure will constitute a material breach of contract. (LTS)

d. Cumulative Air Quality Impacts

Impact AIR-3: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard. (S)

Air pollution in the SFBAAB is generally a cumulative impact; therefore, future development projects contribute to the region's adverse air quality impacts on a cumulative basis. In developing the thresholds of significance, the BAAQMD considered the emission levels for which an individual project's emissions would be cumulatively considerable, including the emissions of criteria pollutants already exceeding CAAQSs and NAAQSs. The SFBAAB is currently designated a nonattainment area for ozone and particulate matter; therefore, a cumulative impact is occurring. As discussed under Impact AIR-1, above, the project's unmitigated emissions of fugitive dust would be considered a cumulatively considerable contribution to this existing impact. As discussed under Impact AIR-2, above, the project's unmitigated exhaust emissions of NOx during construction would exceed the BAAQMD's thresholds of significance, and thus would also result in a cumulatively considerable contribution to this existing impact. The use of the BAAQMD's recommended dust control measures and off-road equipment with Tier 3 or higher engines would reduce the potentially significant cumulative impacts of fugitive dust and NOx from the project under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios to a level that is not cumulatively considerable.

Mitigation Measure AIR-3: Implement Mitigation Measures AIR-1 and AIR-2. (LTS)

C. BIOLOGICAL RESOURCES

This section summarizes the biological setting of the proposed project site (the site); discusses state and local regulations related to biological resources at the proposed project site; assesses potentially significant biological resources impacts resulting from implementation of the project, and provides mitigation measures, where appropriate, to address the identified significant impacts. The information provided in this section is based on (1) online review and research of available resources and literature including the California Department of Fish and Wildlife (CDFW) Natural Communities List and the California Natural Diversity Database (CNDDB); (2) multiple site visits by a Huffman-Broadway Group, Inc. (HBG) wildlife biologist including habitat observations made during qualitative surveys conducted during October 2015, January 2016, May 2016, and July 2016, and a variety of environmental reviews conducted by various staff of HBG for development projects along the Foster City shoreline over the last decade; and (3) a delineation of wetlands and waters of the U.S. pursuant to criteria of Section 404 of the federal Clean Water Act.

1. Environmental Setting

The project site will be generally located within the footprint of the approximately 43,000 foot (8 miles) existing levee system that surrounds Foster City along the bayfront with a slight deviation from the existing levee system footprint where shown in Figure V.C-1. The project site also includes six proposed construction staging areas.

a. Plant Communities

Vegetation communities and habitats at the project site were identified based on the currently accepted List of Vegetation Alliances and Associations (or Natural Communities List).[1] The list is based on A Manual of California Vegetation, Second Edition by Sawyer and Keeler-Wolf,[2] which is the National Vegetation Classification applicable to California. Habitat types discussed in this report are also described based on the California Wildlife Habitat Relationships (CWHR) System for habitat classifications.[3] The CWHR System defines aquatic as well as terrestrial habitats, and is one of the few systems that include urban areas. Wetland habitats potentially subject to federal or state jurisdiction were further

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[1] California Department of Fish and Wildlife (CDFW), 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program. September. http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_list.asp.

[2] Sawyer, J.O. and T. Keeler-Wolf, 2009. A Manual of California Vegetation, Second Edition. In cooperation with The Nature Conservancy and the California Department of Fish and Game, California Native Plant Society. Sacramento, California.

[3] Mayer, E. Kenneth and William F. Laudenslayer, Jr., (Eds.). 1988. *A Guide to Wildlife Habitats of California.*

Source: Huffman Broadway Group, Schaaf & Wheeler, 2016

Figure V.C-1
Foster City Levee Protection Planning and Improvements Project EIR
Project Location Map

classified using the U.S. Fish and Wildlife Service's (USFWS) "Classification System for Wetland and Deepwater Habitats."[4]

HBG biologists conducted field surveys of the approximately 8 miles of levee and six proposed staging areas between October 2015 and July 2016 (as shown in Figure III-1). Along the levee alignment, including the slight deviation from the existing alignment in segment 4, vegetative habitats were mapped within an area extending approximately 25 feet out from the toe of the levee on the bayside side and 100 to 500 feet on the inland side of the levee, an area that was defined primarily for purposes of conducting a wetland delineation. According to criteria of Sawyer and Keeler-Wolf (2009), there are three vegetated communities along the levee alignment: Pacific Coast Salt Marsh, Fennel Patch and Non-native Grassland.

(1) Vegetated Communities Along the Levee Alignment

Pacific Coast Salt Marsh is a wetland habitat. Pacific Coast Salt Marsh consists of all the areas mapped in the wetland delineation as Estuarine Intertidal Emergent or Palustrine Emergent Wetland. Pacific Coast Salt Marsh is found bayside of the levee in segment 1, landward of the levee in segment 2, landward of the levee in the northern portion of segment 3 just south of Bridgeview Park, bayside of the levee in portions of the Foster City Shell Bar (a spit of land extending into the bay composed of clam and mussel shells) in the southern portion of segment 3, and bayside of the levee along Belmont Slough in the northern portion of segment 4 and all along segments 5, 6, and 7, and along O'Neill Slough in segment 8. The levee segments are depicted in Figure V.C-1.

Vegetation within the Pacific Coast Salt Marsh habitat type is primarily Virginia pickleweed (*Salicornia virginica*), and along Belmont Slough and O'Neill Slough there are areas of cordgrass (*Spartina foliosa*). Other species found in the Pacific Coast Salt Marsh habitats include saltgrass (*Distichlis spicata*), jaumea (*Jaumea carnosa*), alkali heath (*Frankenia grandifolia*), fat-hen (*Atriplex patula*), marsh rosemary (*Limonium californicum*), marsh dodder (*Cuscuta salina*), pepperweed (*Lepidium latifolium*), and marsh gum plant (*Grindellia stricta* var. *angustifolia*). Immediately south of Bridgeview Park, areas beyond the landward toe of slope of the levee consist of Pacific Coast Salt Marsh habitat with vegetation that also includes sturdy bulrush (*Bolboschoenus robustus*) and brass buttons (*Cotula coronopifolia*). Small pockets of wetlands south of the Foster City Shell Bar? also contain rabbitsfoot grass (*Polypogon monspeliensis*) and Mediterranean barley (*Hordeum marinum gussoneanum).*

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[4] Cowardin, Lewis M., Virginia Carter, Francis C. Golet, and Edward T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States, for Office of Biological Services, USFWS, U.S. Department of the Interior.

Fennel Patch

Vegetated upland habitats include a Fennel Patch, which is located in an area on the bayside of the existing levee in segment 4, and in which the dominant vegetation is the non-native sweet fennel (*Foeniculum vulgare*). Other plant species found in the Non-native Grassland habitats (see description below) occur along with sweet fennel in this area.

Non-native Grassland

Non-native grassland is often found around the periphery of marsh habitats and on earthen levee slopes and includes non-native grass and herbaceous species such as rip-gut brome *(Bromus diandrus*), wild oat (*Avena fatua*), hare barley (*Hordeum murinum leporinum*), common cheat grass (*Bromus hordaceus),* bristly ox-tongue (*Helminthotheca echioides*), bull mallow (*Malva nicaeensis*), Italian thistle (*Carduus pycnocephalus*), black mustard (*Brassica nigra*), wild radish (*Raphanus sativa*), common sow-thistle (*Sonchus oleraceus*), sweet clover (*Melilotus indica*), salsify (*Tragopogon porrifolius*), and bull thistle (*Cirsium vulgare*).

Much of the project area consists of urban areas or non-vegetated habitats not included in the Sawyer and Keeler-Wolf (2009) criteria. Wildlife habitats in the project area can also be categorized using the CWHR System. Vegetated habitats in the CWHR System are classified as Saline Emergent Marsh and Annual Grassland. The CWHR System includes Urban Habitats, which in the project area include considerable areas of lawn, landscaping species or extensive areas along the levee that are vegetated with ice plant (*Caprobrotus edulis*) and weedy non-native species. Pampass grass (*Cortaderia selloana*) and planted Monterey cypress (*Cupressus macrocarpa*) are found near State Route 92 also known as the San Mateo Bridge.

Additional habitats present include rocky areas of the shoreline (in the project area including riprap levee slopes and the Foster City Shell Bar), and mudflats located just offshore in the bay. Under the CWHR System, these areas of rocky shore and mudflat would be considered Barren (or free of vegetation) (Mayer and Laudenslayer, 1988).

A detailed description of vegetative communities and dominant plant species present within each segment of the levee can be found in the Biological Assessment prepared by HBG for the City of Foster City[5] Levee Protection Planning and Improvements Project (see Appendix C).

[5] Huffman-Broadway Group, Inc. (HGB), 2016a. *Biological Assessment, City of Foster City Levee Protection Planning and Improvements Project (CIP 301-657) Project, City of Foster City, California*. Prepared for City of Foster City, California. September.

(2) Staging Areas

As shown in Figure V.C-1, the first proposed staging areas is 0.6 acres and located in an asphalt-paved parking lot and storage area of the City's corporation yard adjacent to the northwest end of the Foster City Lagoon, a site containing only sparse ruderal or weedy vegetation. The second, third, and fourth proposed staging areas would be located near the base of the San Mateo Bridge/SR 92 and include a 0.8-acre asphalt-paved access road and adjacent gravel covered area southwest of the bridge, a 0.3-acre landscaped and gravel-covered area north of the bridge, and a 0.2-acre landscaped picnic area south of the bridge, respectively. Vegetation is solely landscaping or ruderal species (i.e., a plant species that is first to colonize land disturbed by humans). A fifth 5.4-acre linear staging area would be located within the east side of Beach Park Boulevard from south of Bridgeview Park to south of Shorebird Park and would be within the paved right-of-way of Beach Park Boulevard and free of vegetation. These first five staging areas consist of Urban Habitat with associated weedy species and landscaping and no areas that would be considered Non-native Grassland.

The sixth staging area would be located in the upland area within the northern and western perimeter levee adjacent to the Sea Cloud Phase II sedimentation basin within the Foster City Dredge Disposal Site, a 19-acre area located between the Bay Trail/levee and Sea Cloud Park. The sixth staging area would be located within 3.8 acres of uplands making up the area on the north side of the basin and along the levee between the basin and Sea Cloud Park. Biological studies were recently prepared for this area as part of the Biological Assessment for the Dredging at the Lagoon Intake Structure (CIP 301-629) Project[6] that evaluated the vegetation in the northern approximately 1.5-acre portion of the 3.8-acre area as a staging area for the Lagoon Intake Structure Project and the approximately 2.3 acres along the western portion of the 3.8-acre area as an alternative dredge disposal site for the Lagoon Intake Structure dredging project.

The habitat type within the northern approximately 1.5-acre area of the sixth staging area is a mix of Non-native Grassland and Urban Habitat (ruderal vegetation). Vegetation within this area is sparse, consisting of mostly non-native herbaceous plants and grasses. The paved pedestrian path between the Bay Trail and Sea Cloud Park traverses this area, and a portion of the area is bare ground. Dominant non-native species include sweet fennel, ice plant, rip-gut brome, wild oats, fescue (*Festuca perennis*), foxtail barley, redstem filaree (*Erodium cicutarium*), bull mallow, sweet clover, and scarlet pimpernel (*Anagalus arvensis*), among others. Saltgrass is found along the edge of the Foster City Lagoon at the west end of the proposed staging area. The remaining approximately 2.3 acres along the western levee is Non-native Grassland habitat with vegetation including ice plant, sweet fennel, rip-gut brome, fescue, wild oats, foxtail barley, sweet clover, and bull

[6] Huffman-Broadway Group, Inc. (HGB), 2016b. *Biological Assessment, Dredging at the Lagoon Intake Structure (CIP 301-629) Project, City of Foster City, California*. Prepared for City of Foster City, California. April

mallow and other species such as wild radish, bristly ox-tongue, bull thistle, sow thistle, Italian thistle, chicory (*Cichorium intybus),* velvet grass (*Holcus lanatus*), bird's foot trefoil (*Lotus corniculatus*), batis (*Batis maritima*), and plantain (*Plantago* sp.). Scattered coyote brush (*Baccharis pilularis*), a native species, is also present, along with some non-native pampas grass. Non-native planted trees, including Monterey pine (*Pinus radiata*), eucalyptus (*Eucalyptus* sp.) and Acacia (*Acacia* sp.), line the western edge of the proposed staging area along the border of Sea Cloud Park.

The central basin for the 19-acre Foster City Lagoon Dredge Disposal site is primarily open water during the winter months and is mostly unvegetated during the dry season. Several small islands within the basin are vegetated with species such as ice plant, pickleweed and Italian thistle, and a fringe of wetland vegetation around the perimeter includes pickleweed and alkali heath, as well as ice plant and other species. A portion of the 19-acre Foster City Lagoon Dredge Disposal Site was used as a wetland mitigation site as part of the Foster City Lagoon Dredge Disposal Project in 2004.[7] Mitigation wetlands were created around the edges of the basin as shown in Figure V.C-2 (obtained from the final monitoring report for the Foster City Lagoon Dredge Disposal Project). The successful mitigation wetlands are adjacent to the proposed staging area for the proposed levee improvement project, and consist of palustrine emergent vegetation (1.89 acres dominated by pickleweed, and 0.97 acres dominated by the obligate submerged aquatic plant widgeongrass, *Ruppia maritima*).[8] The boundaries of the proposed sixth staging area follow those identified as part of the previous evaluations as an upland disposal site for the Lagoon Intake Structure (CIP 301-629) Project, that were specifically drawn to avoid all mitigation wetlands created in 2004 as part of the original Foster City Lagoon Dredge Disposal Project.

b. Animal Populations

The wildlife species discussed in this study are based on review of available literature, visits to the Foster City shoreline area by HBG wildlife biologists over many years, habitat observations made during qualitative surveys conducted by HBG wildlife biologists during October 2015, January 2016, and May of 2016, and a variety of environmental reviews conducted by HBG for development projects along the Foster City shoreline conducted for development projects over the last decade. Table V.C-1 lists all wildlife species known to occur on the project site and in the site vicinity and includes the scientific names of all species mentioned in the text.

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[7] Huffman-Broadway Group, Inc., 2012. Years 3, 4, and, 5 Mitigation Monitoring Report Foster City Lagoon Dredge Disposal Project, City of Foster City, San Mateo County, California. Prepared for the City of Foster City, December.

[8] Ibid.

Source: Huffman Broadway Group, 2016

Figure V.C-2
Foster City Levee Protection Planning and Improvements Project EIR
Foster City Dredge Disposal Mitigation Site

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Amphibians and Reptiles	
Pacific Tree Frog	*Hyla regilla*
Western Fence Lizard	*Sceloporus occidentalis*
Gopher Snake	*Pituophis melanoleucus*
Common Garter Snake	*Thamnophis sirtalis*
Birds	
Cackling Goose	*Branta hutchinsii*
Canada Goose	*Branta canadensis*
Gadwall	*Anas strepera*
Eurasian Wigeon	*Anas penelope*
American Wigeon	*Anas americana*
Mallard	*Anas platyrhynchos*
Blue-winged Teal	*Anas discors*
Cinnamon Teal	*Anas cyanoptera*
Northern Shoveler	*Anas clypeata*
Northern Pintail	*Anas acuta*
Green-winged Teal	*Anas crecca*
Canvasback	*Aythya valisineria*
Redhead	*Aythya americana*
Ring-necked Duck	*Aythya collaris*
Tufted Duck	*Aythya fuligula*
Greater Scaup	*Aythya marila*
Lesser Scaup	*Aythya affinis*
Harlequin Duck	*Histrionicus histrionicus*
Surf Scoter	*Melanitta perspicillata*
White-winged Scoter	*Melanitta fusca*
Long-tailed Duck	*Clangula hyemalis*
Bufflehead	*Bucephala albeola*
Common Goldeneye	*Bucephala clangula*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Barrow's Goldeneye	*Bucephala islandica*
Hooded Merganser	*Lophodytes cucullatus*
Common Merganser	*Mergus merganser*
Ruddy Duck	*Oxyura jamaicensis*
California Quail	*Callipepla californica*
Red-throated Loon	*Gavia stellata*
Common Loon	*Gavia immer*
Pied-billed Grebe	*Podilymbus podiceps*
Horned Grebe	*Podiceps auritus*
Eared Grebe	*Podiceps nigricollis*
Western Grebe	*Aechmophorus occidentalis*
Clark's Grebe	*Aechmophorus clarkii*
Double-crested Cormorant	*Phalacrocorax auritus*
American White Pelican	*Pelecanus erythrorhynchos*
Brown Pelican	*Pelecanus occidentalis*
Great Blue Heron	*Ardea herodias*
Great Egret	*Ardea alba*
Snowy Egret	*Egretta thula*
Green Heron	*Butorides virescens*
Black-crowned Night-Heron	*Nycticorax nycticorax*
Turkey Vulture	*Cathartes aura*
Osprey	*Pandion haliaetus*
White-tailed Kite	*Elanus leucurus*
Northern Harrier	*Circus cyaneus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
Red-shouldered Hawk	*Buteo lineatus*
Red-tailed Hawk	*Buteo jamaicensis*
Ridgway's Rail	*Rallus obsoletus*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Virginia Rail	*Rallus limicola*
Sora	*Porzana carolina*
American Coot	*Fulica americana*
Black-necked Stilt	*Himantopus mexicanus*
American Avocet	*Recurvirostra americana*
Black-bellied Plover	*Pluvialis squatarola*
Snowy Plover	*Charadrius nivosus*
Semipalmated Plover	*Charadrius semipalmatus*
Killdeer	*Charadrius vociferus*
Spotted Sandpiper	*Actitis macularius*
Greater Yellowlegs	*Tringa melanoleuca*
Willet	*Tringa semipalmata*
Lesser Yellowlegs	*Tringa flavipes*
Whimbrel	*Numenius phaeopus*
Long-billed Curlew	*Numenius americanus*
Marbled Godwit	*Limosa fedoa*
Ruddy Turnstone	*Arenaria interpres*
Black Turnstone	*Arenaria melanocephala*
Red Knot	*Calidris canutus*
Surfbird	*Calidris virgata*
Sanderling	*Calidris alba*
Dunlin	*Calidris alpina*
Least Sandpiper	*Calidris minutilla*
Western Sandpiper	*Calidris mauri*
Short-billed Dowitcher	*Limnodromus griseus*
Long-billed Dowitcher	*Limnodromus scolopaceus*
Wilson's Snipe	*Gallinago delicata*
Red-necked Phalarope	*Phalaropus lobatus*
Bonaparte's Gull	*Chroicocephalus philadelphia*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Mew Gull	*Larus canus*
Ring-billed Gull	*Larus delawarensis*
Western Gull	*Larus occidentalis*
California Gull	*Larus californicus*
Herring Gull	*Larus argentatus*
Thayer's Gull	*Larus thayeri*
Glaucous-winged Gull	*Larus glaucescens*
Least Tern	*Sternula antillarum*
Elegant Tern	*Thalasseus elegans*
Caspian Tern	*Hydroprogne caspia*
Forster's Tern	*Sterna forsteri*
Black Skimmer	*Rynchops niger*
Rock Pigeon	*Columba livia*
Eurasian Collared-Dove	*Streptopelia decaocto*
Mourning Dove	*Zenaida macroura*
Barn Owl	*Tyto alba*
Great Horned Owl	*Bubo virginianus*
Vaux's Swift	*Chaetura vauxi*
White-throated Swift	*Aeronautes saxatalis*
Anna's Hummingbird	*Calypte anna*
Rufous Hummingbird	*Selasphorus rufus*
Allen's Hummingbird	*Selasphorus sasin*
Belted Kingfisher	*Megaceryle alcyon*
Nuttall's Woodpecker	*Picoides nuttallii*
Downy Woodpecker	*Picoides pubescens*
Northern Flicker	*Colaptes auratus*
American Kestrel	*Falco sparverius*
Merlin	*Falco columbarius*
Peregrine Falcon	*Falco peregrinus*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Black Phoebe	*Sayornis nigricans*
Say's Phoebe	*Sayornis saya*
Loggerhead Shrike	*Lanius ludovicianus*
Western Scrub-Jay	*Aphelocoma californica*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Cliff Swallow	*Petrochelidon pyrrhonota*
Barn Swallow	*Hirundo rustica*
Chestnut-backed Chickadee	*Poecile rufescens*
Oak Titmouse	*Baeolophus inornatus*
Bushtit	*Psaltriparus minimus*
Marsh Wren	*Cistothorus palustris*
Bewick's Wren	*Thryomanes bewickii*
Ruby-crowned Kinglet	*Regulus calendula*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Northern Mockingbird	*Mimus polyglottos*
European Starling	*Sturnus vulgaris*
American Pipit	*Anthus rubescens*
Cedar Waxwing	*Bombycilla cedrorum*
Orange-crowned Warbler	*Oreothlypis celata*
Common Yellowthroat	*Geothlypis trichas*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaga coronata*
Townsend's Warbler	*Setophaga townsendi*
California Towhee	*Melozone crissalis*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Savannah Sparrow	*Passerculus sandwichensis*
Fox Sparrow	*Passerella iliaca*
Song Sparrow	*Melospiza melodia*
Lincoln's Sparrow	*Melospiza lincolnii*
White-crowned Sparrow	*Zonotrichia leucophrys*
Golden-crowned Sparrow	*Zonotrichia atricapilla*
Dark-eyed Junco	*Junco hyemalis*
Western Tanager	*Piranga ludoviciana*
Red-winged Blackbird	*Agelaius phoeniceus*
Tricolored Blackbird	*Agelaius tricolor*
Western Meadowlark	*Sturnella neglecta*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown-headed Cowbird	*Molothrus ater*
Hooded Oriole	*Icterus cucullatus*
House Finch	*Haemorhous mexicanus*
Purple Finch	*Haemorhous purpureus*
Pine Siskin	*Spinus pinus*
Lesser Goldfinch	*Spinus psaltria*
American Goldfinch	*Spinus tristis*
House Sparrow	*Passer domesticus*
Mammals	
Opossum	*Didelphis virginiana*
California Ground Squirrel	*Spermophilus beecheyi*
Botta's Pocket Gopher	*Thomomys bottae*
Norway Rat	*Rattus norvegicus*
House Mouse	*Mus musculus*
Deer Mouse	*Peromyscus maniculatus*
Black-tailed Jackrabbit	*Lepus californicus*
Raccoon	*Procyon lotor*

TABLE V.C-1 WILDLIFE SPECIES KNOWN TO OCCUR IN THE PROJECT AREA

Common Name	Scientific Name
Striped Skunk	*Mephitis mephitis*

Sources: National Geographic Society, 2011. *Field Guide to the Birds of North America*. Sixth Edition. National Geographic Society, Washington, D.C.
Reid, Fiona A. 2006. *Mammals of North America*. Peterson Field Guides. Fourth Edition. Houghton Mifflin Co., Boston.
Sibley, David A. 2014. *The Sibley Guide to Birds*. Second Edition. National Audubon Society. Chanticleer Press, Inc. New York, N.Y. 624 pp.
Stebbins, R.C. 2003. *Western Reptiles and Amphibians*. Peterson Field Guides. Houghton Mifflin Co., Boston. Third edition.

The wetland habitats and the disturbed urban habitats on-site support a variety of wildlife species. The complex of habitats includes San Francisco Bay and the presence of tidal regimes and marshes, which can accommodate wildlife adapted to aquatic areas, and upland vegetation including mostly planted trees and shrubs that provide potential nesting and roosting sites for birds, in addition to foraging areas for species of mammals, reptiles, amphibians and birds.

Much of the project area is an urban area with Urban Habitats that support a variety of wildlife adapted to living in disturbed areas. Such areas support a variety of widespread bird species that are adapted to urban areas and disturbed areas and that are known to occur throughout the project area. Bird species that have been observed in the combination of disturbed habitats along the levee and inland locations include rock pigeon, mourning dove, Eurasian collared-dove, black phoebe, Anna's hummingbird, American crow, common raven, European starling, Northern mockingbird, American robin, California towhee, yellow-rumped warbler (winter), white-crowned sparrow, golden-crowned sparrow, song sparrow, Brewer's blackbird, red-winged blackbird, American goldfinch, house finch, and house sparrow. Other species include Canada goose and killdeer. Raptors such as red-tailed hawk, red-shouldered hawk, American kestrel, and occasionally Peregrine falcons can be found in the area. Mammals include those adapted to the urban environments such as Virginia opossum, Botta's pocket gopher, deer mouse, house mouse, Norway rat, striped skunk, and raccoon. Common amphibians such as Pacific tree frog would be found within the project vicinity, along with reptiles such as common garter snake, gopher snake, and Western fence lizard. The wildlife populations of all six of the proposed staging areas consist of the common species of birds, mammals, reptiles and amphibians that would commonly be found in Urban Habitats and disturbed sites in Foster City.

The shoreline of San Francisco Bay, particularly along levee segments 2 through 4, supports a variety of shorebirds along the shoreline and riprap levee slopes as well as diving ducks and many other species using the bay waters. Expected species just offshore in the bay along the levee here include: double-crested cormorant, grebes (horned, eared, Western and Clark's), loons (common and red-throated), and waterfowl (diving ducks such as bufflehead, lesser scaup, common goldeneye. and surf scoter), among others. Some species that are rare to the Bay Area have been seen in the bay here such as long-tailed duck, tufted duck, and harlequin duck.

Segments 3 and 4 of the levee are particularly good habitat for a variety of shorebirds, with the focus of shorebird habitat being the Foster City Shell Bar area in segment 3. The Foster City Shell Bar is an often visited area by the San Mateo County birding community and by nature enthusiasts from throughout the region, who come to this area to observe the spectacle of wintering shorebirds. Shorebirds usually present in large numbers here in winter include black-bellied plover, long-billed curlew, willet, marbled godwit, ruddy and black turnstones, red knot, Western and least sandpipers, dunlin, both short-billed and long-billed dowitchers, Forster's tern, black skimmer and gulls such as California, Western, and ring-billed. Other birds along the shoreline may include great blue heron, great and snowy egret and brown pelican. Spotted sandpipers can be found anywhere along the shoreline foraging on the toe of the riprap slopes on the bayside of the levee.

The Foster City Shell Bar is one of the most important shorebird habitats in the South Bay. The Shell Bar is probably the most important wintering site for red knots in the South Bay, and one of the few spots where they can reliably be seen, with counts of 100 or 200 birds not uncommon during the winter months.

Salt marsh habitats adjacent to segment 1, also adjacent to Bridgeview Park in segment 3, along Belmont Slough in segments 4 through 7, and along O'Neill Slough in segment 8 are important habitats for songbirds such as black phoebe, Say's phoebe, song sparrow, savannah sparrow, and common yellowthroat. These salt marsh habitats also serve as foraging habitats for a variety of herons and egrets and shorebirds; and along Belmont and O'Neill Sloughs (the southern extent of segment 4 and segments 5 through 8), provide suitable foraging and nesting habitat for the federally listed endangered Ridgway's rail and to a lesser extent the state-listed threatened California black rail. The mudflats within Belmont Slough at lower tides provides excellent shorebird foraging habitat for species as mentioned not only along the bay frontage, but also along the Slough to include others such as American avocet and black-necked stilt. Also using Belmont Slough are a variety of waterfowl, but here the common ducks are dabbling ducks rather than diving ducks, such as mallard, Northern shoveler, Northern pintail, American wigeon, green-winged teal, cinnamon teal, gadwall, and even the uncommon hooded merganser (observed by HBG). Diving ducks occur along the slough channels and may include others not commonly found on the bay such as canvasback.

The sedimentation basin for the Foster City Dredge Disposal Site inland of levee segments 5 and 6, provides excellent winter foraging habitat for a variety of dabbling ducks, all shorebirds mentioned, herons and egrets, as well as gulls and terns, and nesting by species such as American avocet during wet years. Mammals not commonly seen elsewhere along the levee alignment are commonly seen at the Dredge Disposal Site, including California ground squirrel and black-tailed jackrabbit. Ground squirrels are also common along the levee adjacent to Belmont Slough.

c. Wetland and Other Waters of the U.S. Delineation

(1) Background

The Department of the Army, acting through the United States Army Corps of Engineers (USACE), has the authority to permit the discharge of dredged or fill material into the waters of the U.S. under Section 404 of the federal Clean Water Act (CWA), and permit work and placement of structures in navigable waters of the U.S. under Section 10 of the Rivers and Harbors Act of 1899. The U.S. Environmental Protection Agency (EPA) and USACE define wetlands as: "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (EPA regulations at 40 Code of Federal Regulations [CFR] Section 230.3(t); USACE regulations at 33 CFR Section 328.3(b)).[9]

Under Section 10 of the Rivers and Harbors Act of 1899, the USACE also regulates the construction of structures in, over, or under; excavation of material from; or deposition of material into navigable waters. As described by USACE regulation 33 CFR Section 329.4, the general definition of "navigable waters" includes those waters subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or might be susceptible for use to transport interstate or foreign commerce.

(2) Methodology

For purposes of a delineation of waters of the U.S. along the levee alignment, the study area for the delineation was defined as an area extending approximately 25 feet out from the toe of the levee on the bayside and 100 to 500 feet on the inland side. The area of the defined study area totals approximately 107.7 acres (study area) and encompasses the area of the project footprint and immediately adjacent areas where construction worker access or wetland mitigation may be warranted. HBG conducted field studies for a

[9] United States Army Corps of Engineers (USACE), 2012. Nationwide Permits, Conditions, District Engineer's Decision, Further Information, and Definitions (with corrections). http://www.usace.army.mil/Portals/2/docs/civilworks/nwp/2012/NWP2012_corrections_21-sep-2012.pdf, accessed November 23, 2015.

preliminary wetland delineation within the study area between December 2015 and July 2016. The study areas are depicted in Figures 11a through 11h of Appendix C.

The focus of HBG's investigation was to identify and map areas meeting the definition of wetlands and other waters of the U.S. in accordance with definitions of jurisdictional waters, the USACE *Wetlands Delineation Manual* (1987 Manual),[10] the USACE 2008 *Regional Supplement to Corps of Engineers Wetland Delineation Manual: Arid West, Version 2.0* (Arid West Regional Supplement),[11] and supporting guidance documents. The 1987 Manual provides technical guidance and procedures, from a national perspective, for identifying and delineation of wetlands that may be subject to Section 404 of the CWA. Pursuant to the 1987 Manual, key criteria for determining the presence of wetlands are: (a) the presence of inundated or saturated soil conditions resulting from permanent or periodic inundation by groundwater or surface water; and (b) a prevalence of vegetation typically adapted for life in saturated soil conditions (i.e., hydrophytic vegetation). Explicit in the definition is the consideration of three environmental parameters: hydrology, soil, and vegetation. The Arid West Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. The combined use of the 1987 Manual and Arid West Regional Supplement enhances the technical accuracy, consistency, and credibility of wetland determinations.

In preparation for HBG's detailed field survey, existing landforms on-site that would likely contain potential waters of the US, including wetlands, were identified by reviewing U.S. Geological Survey (USGS) topographic mapping; high resolution aerial photography sourced from the National Agriculture Imagery Program (NAIP); Natural Resources Conservation Service (NRCS) Soils Map of the study area; and light detection and ranging (LIDAR) topographic survey prepared by Schaaf & Wheeler. Field data (e.g., soil, vegetation and hydrology), and location of the high tide line were documented using a hand-held Trimble Geo XH Global Positioning System (GPS) unit with sub-meter accuracy after geo-processing. GPS data was incorporated into an HBG database using ESRI ARCGIS software and geo-referenced in overlay fashion onto orthorectified aerial photographs along with the Schaaf & Wheeler LIDAR topographic survey data. Ground truthing and detailed field studies were conducted on several days between December 2015 and July 2016.

The high tide line was typically located up to the extent of the tidal wetlands, where wetlands were present. Along areas where wetlands were not present the high tide line was determined by the observation of a more or less continuous deposit of debris and

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[10] United States Army Corps of Engineers (USACE), 1987. Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-1. Prepared by the Environmental Laboratory, Department of the Army, Waterways Experiment Station, Vicksburg, Miss.

[11] United States Army Corps of Engineers (USACE), 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0), Ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble, ERDC/EL TR-08-28, Vicksburg, MS: U.S. Army Engineer Research and Development Center.

other physical markings such as water staining along the riprap. Point locations were documented in several locations using a hand-held Trimble Global Positioning System (GPS) unit with sub-meter accuracy after geo-processing. GPS data were incorporated into an HBG database using ESRI ARCGIS software and geo-referenced in overlay fashion onto orthorectified aerial photographs along with the Schaaf & Wheeler topographic survey data. The high tide line GPS point locations were then tied to a topographic elevation and mapped along the shoreline (e.g., connecting the GPS points).

The Schaaf & Wheeler topographic survey data provided topographic contour lines at one-foot intervals. The Mean High Water (MHW) within the study area extended up to 6.22 feet NAVD88. Based on the accuracy of the topographic survey HBG mapped MHW at approximately the 6-foot contour line along the shoreline. In areas that extended out into the marsh the MHW was mapped at the edge of open slough channels. In general, the edge of the open water slough channels followed the 6-foot contour line, sometimes extending further depending on aerial interpretation of the edge of the open slough channel.

The extent and location of "Non-Tidal Historic Navigable Waters of U.S." was determined by overlaying historic topographic surveys of San Francisco Bay[12] onto current aerials of the study area. All non-tidal areas that have not been improved and are at or below MHW where mapped as "Non-Tidal Historical Navigable Waters of the U.S."

(3) Results

Within the 107.7-acre study area a total of 17.01 acres was determined to satisfy criteria as either wetlands or waters of the U.S. Four types of areas determined to be under USACE jurisdiction were determined to be present in the project area according to the Cowardin (1979) criteria. These areas include (1) Palustrine Emergent Wetland, (2) Estuarine Intertidal Emergent Wetland, (3) Estuarine Intertidal Unconsolidated Shore, and (4) Estuarine Intertidal Artificial Rocky Shore. Some areas within these four categories are determined to be subject to Section 404 jurisdiction under the CWA and others are subject to Section 10 jurisdiction under the RHA, as shown in Table V.C-2. Potentially regulated wetlands were found bayside of the levee in segment 1, landward of the levee in segment 2, landward of the levee in the northern portion of segment 3 just south of Bridgeview Park, bayside of the levee in portions of the Foster City Shell Bar in the southern portion of segment 3, and bayside of the levee along Belmont Slough in the northern portion of segment 4 and all along segments 5, 6, and 7, and along O'Neill Slough in segment 8. Levee segments are depicted in Figure V.C-1.

[12] Source of the historic survey maps are from Treasury Department U.S. Coast and Geodetic Survey from December 20, 1897 to February 8, 1898. Register No. 2310.

TABLE V.C-2 WETLANDS AND WATERS OF THE U.S. POTENTIALLY SUBJECT TO USACE JURISDICTION UNDER SECTION 404 OF THE CWA AND SECTION 10 OF THE RHA.

Wetland/Water Type	Regulatory Jurisdiction	Area (Acres)
Palustrine Emergent Wetland	Section 404 CWA[13]	8.28
Estuarine Intertidal Emergent Wetland	Section 404 CWA	4.99
Estuarine Intertidal Emergent Wetland	Section 404 CWA and Section 10 RHA	0.05
Estuarine Intertidal Unconsolidated Shore	Section 404 CWA	0.16
Estuarine Intertidal Unconsolidated Shore	Section 404 CWA and Section 10 RHA	0.72
Estuarine Intertidal Artificial Rocky Shore	Section 404 CWA	1.67
Estuarine Intertidal Artificial Rocky Shore	CWA Section 404 and RHA Section 10	1.14
Total		**17.01**

Source: Cowardin, 1979.

Aquatic resources within the study area and adjacent to the study area were examined with respect to the *Solid Waste Agency of Northern Cook County (SWANCC) v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001) exclusion from Clean Water Act regulation. No areas were found that could either potentially be exempted or excluded from regulation in accordance with SWANCC. HBG has also reviewed the wetlands with respect to the *Rapanos v. United States* and *Carabell v. United States* 547 U.S. 715 (2006) decision and found the areas in question to be jurisdictional pursuant to the USACE criteria. The SWANCC and Rapanos Supreme Court decisions are discussed in greater detail in Section 2 (Regulatory Framework).

d. Special-Status Species

Sensitive species include those listed by the federal and state governments as endangered, threatened, or rare or candidate species for these lists. Endangered or threatened species are protected by the federal Endangered Species Act of 1973 as amended, the California Native Plant Protection Act of 1977, and the California Endangered Species Act of 1970. California Environmental Quality Act (CEQA) provides additional protection for unlisted species that meet the “rare” or “endangered” criteria defined in 14 CCR Section 15380.

[13] Approximately 0.12 acres of the Palustrine Emergent Wetlands may be considered “Non-Tidal Historical Navigable Waters” and subject to Section 10 RHA jurisdiction.

The CDFW maintains records for the distribution and known occurrences of sensitive species and habitats in the CNDDB. The CNDDB is organized into map areas based on 7.5-minute topographic maps produced by the USGS. All known occurrences of sensitive species and important natural communities are mapped onto the quadrangle map. A search of the CNDDB records of occurrence for special-status animals, fish, and plants and natural communities within these quadrangles indicated that several special-status species or natural communities are known to occur in the immediate area of the project.

(1) Special-Status Plant Species

Special-status plant species include: (1) species that are listed or proposed for listing as threatened or endangered under the federal Endangered Species Act; (2) species that are listed, or proposed for listing by the state of California as threatened or endangered under the California Endangered Species Act; (3) plants considered by the California Native Plant Society to be rare, threatened, or endangered in California and elsewhere; and (4) plant species that meet the definition of rare or endangered under CEQA.

Most of the special-status species of plants found in this part of San Mateo County are species adapted to serpentine soils. These soils occur in areas near I-280 such as Pulgas Ridge near Hillsborough, the area around Crystal Springs Reservoir, and Edgewood County Park. Serpentine soils do not occur anywhere near the project site, and none of these species would be found in the project site. Habitat conditions in the project site are potentially suitable for only one special-status plant species, Point Reyes bird's beak (*Cordylanthus maritimus palustris*), but this species is known only from collections made approximately 100 years ago at the mouth of Redwood Creek and Belmont Slough. No special-status plant species were observed at the property during floristic surveys conducted at the site, and none are expected to occur in the project site.

(2) Special-Status Animal Species

Federally and state-listed special-status animal species that are either known to occur within the project area, have a potential to occur at the site, or that require specific study to determine presence/absence, are discussed below.

In addition to the state and federally listed species noted below, Burrowing Owl (*Athene cunicularia*) has also been known to occur along the Foster City shoreline. Burrowing Owl is not a listed species but is a state-designated species of special concern and a USFWS-designated Bird Species of Conservation Concern. The last known breeding site for Burrowing Owl in San Mateo County was along the Bay Trail to the west of the Mariners Point Golf Center in the area between levee segments 1 and 2, but the species has been extirpated from that site.

Salt Marsh Harvest Mouse

The salt marsh harvest mouse is state and federally listed as endangered and is a California Fully Protected Species. The salt marsh harvest mouse is generally restricted to saline or subsaline marsh habitats around the San Francisco Bay estuary though it is found in mixed saline/brackish areas in the Suisun Bay area. The basic habitat of the salt marsh harvest mouse is *Salicornia*-dominated vegetation. Other highly important habitat considerations include high tide/flood refugia (both at the upper edge of the marsh and within mature marshes as areas of emergent gum plant, *Grindelia* sp., even at the highest high tides), seasonal use of terrestrial grassland, exploitation of suboptimal habitats, and habitat selection in brackish marsh vegetation where *Salicornia* is a relatively minor component.

Although the CNDDB contains no San Mateo County reports of salt marsh harvest mouse anywhere north of the San Mateo Bridge/SR 92, there are some records of the species south of the San Mateo Bridge/SR 92 in Foster City. The nearest known reported occurrence of salt marsh harvest mouse to the project area is located within Foster City in a tidal marsh adjacent to Highway 101 within O'Neill Slough. This location is adjacent to the western end of segment 8. Salt marsh harvest mouse was collected from this site in 1960, and there have been no documentation of the species at this location since that time. The next nearest populations of salt marsh harvest mouse in the project area are within tidal marshes on Bair Island between Steinberger Slough and Redwood Creek, locations that are about two miles from the nearest location along the Foster City levee. The salt marsh harvest mouse recovery plan[14] identifies tidal marshes surrounding Bair Island as habitat essential to the species' recovery.

The salt marsh habitat on the bayside of the levee within Belmont Slough in segments 4 (south of Shorebird Park), 5, 6, and 7 and within O'Neill Slough in segment 8 are considered potentially suitable habitat for salt marsh harvest mouse. It is possible that salt marsh harvest mouse could occur within the salt marsh habitats anywhere along these levee segments.

Ridgway's Rail (Formerly California Clapper Rail)

Ridgway's rail is state and federally listed as endangered and is a California Fully Protected Species. Ridgway's rails are typically found in the intertidal zone and sloughs of salt and brackish marshes dominated by pickleweed, Pacific cordgrass, gum plant, saltgrass, jaumea, and adjacent upland refugia. They may also occupy habitats with other vegetative components, which include, but are not limited to, bulrush (*Bolboschoenus americanus* and *B. maritimus*), cattails (*Typha* spp.) and Baltic rush (*Juncus balticus*). Ridgway's rail

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[14] U.S. Fish and Wildlife Service (USFWS), 1984. Salt Marsh Harvest Mouse and California Clapper Rail Recovery Plan. Portland, Oregon.

typically feeds on benthic invertebrates, but its diet is wide ranging, and includes seeds, and occasionally small mammals such as the salt marsh harvest mouse. The Ridgway's rail breeding season, including pair bonding and nest construction, may begin as early as February. The end of the breeding season is typically defined as the end of August. Ridgway's rails build their nests near tidal sloughs using cordgrass and pickleweed.

Based on information contained in the CNDDB, Ridgway's rail is known to occur within the salt marshes along Belmont Slough. Specific CNDDB records report Ridgway's rail breeding populations at Belmont Slough as recently as 1975. Additional reports of Ridgway's rail are known from northwest of the Mariners Point Golf Center and beyond the project area near the mouth of Seal Slough.

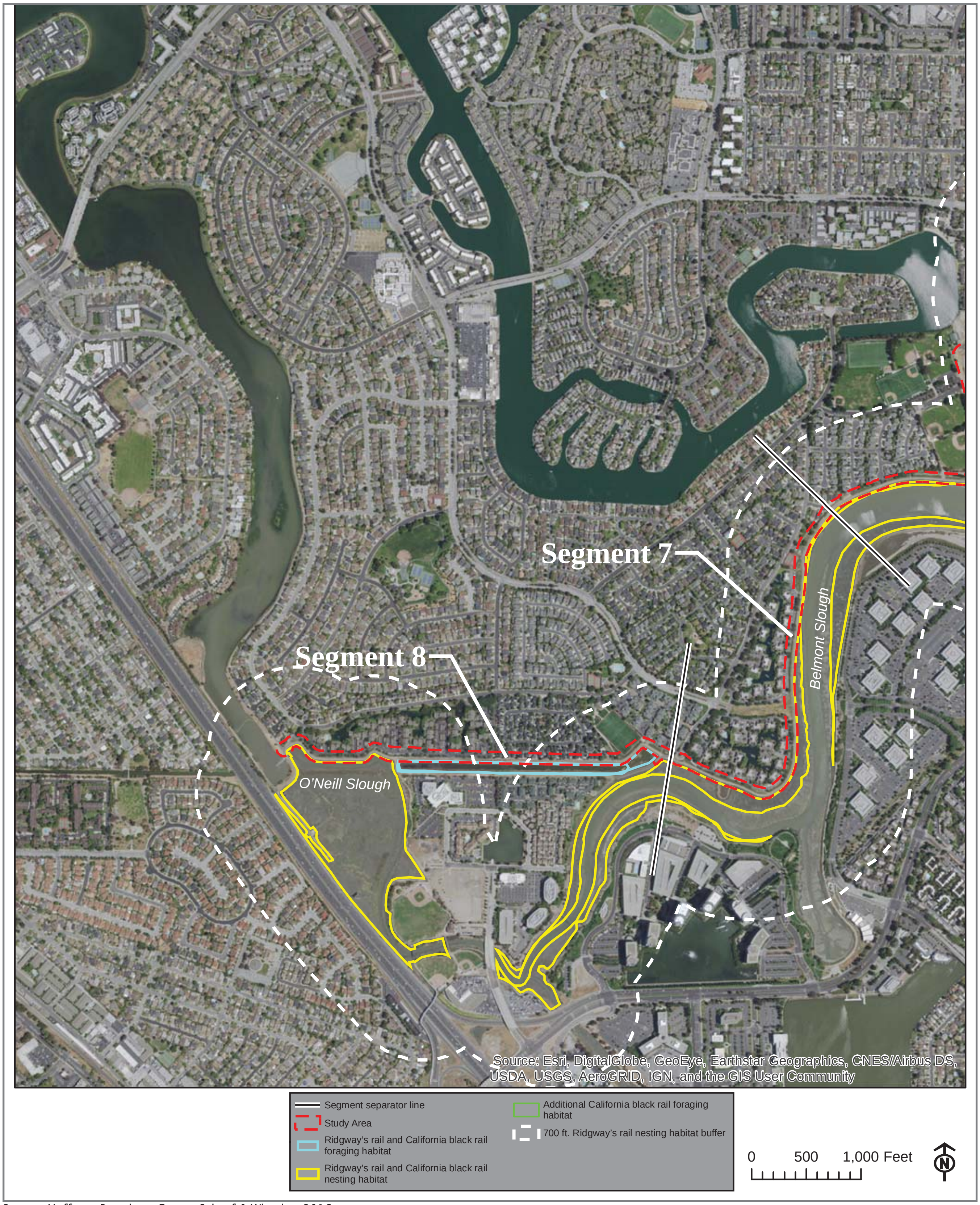
Areas of potentially suitable nesting and foraging habitat for Ridgway's rail were assessed in the field on November 16, 2015 by HBG wildlife biologist Gary Deghi and Ridgway's rail species expert Jules Evens of Avocet Research Associates. Nesting habitats were identified if certain criteria were met including an abundance of cordgrass (*Spartina foliosa*), presence of higher channel densities including second and third order systems, and a combination of low marsh vegetation with high marsh and presence of gum plant (*Grindelia* sp.).

Pickleweed and cordgrass vegetation occurs within the portion of the project site bayside of the levee within Belmont Slough and O'Neill Slough and nesting and foraging habitats occur along these slough channels. Nesting habitat for Ridgway's rail can be found in the salt marsh habitats immediately adjacent to the levee in segments 5 (southern portion), 6, and 7 along Belmont Slough, and adjacent to the levee in segment 8 (western portion) along O'Neill Slough (see Figure V.C-3 and 4). Other areas of pickleweed provide suitable foraging habitats for Ridgway's rail, and such habitats can be found adjacent to the levee in segment 1 (see Figure V.C-5) and also along Belmont Slough in the eastern portion of segment 8 (Figure V.C-4), where the marsh within the muted tidal channel lacks complexity in terms of vegetation and presence of small channels to provide suitable nesting areas. Suitable foraging habitat is also found adjacent to segment 4 (southern portion) and 5 (northern portion), and is also found in tidal areas toward the bay east of Shorebird Park in segment 4 (see Figure V.C-3).

The USFWS considers construction activity taking place within 700 feet of an active Ridgway's rail nest as an impact due to potential nesting disturbance. Therefore, Figure V.C-3 and 4 shows a 700-foot buffer zone around all areas of salt marsh determined to be suitable nesting habitat for Ridgway's rail. Nesting habitat for Ridgway's rail occurs in segments 5 (southern portion), 6, 7, and 8 (western portion), and the figures show that the 700-foot setback area encompasses all portions of the levee from Shorebird Park in segment 4 to O'Neill Slough in segment 8.

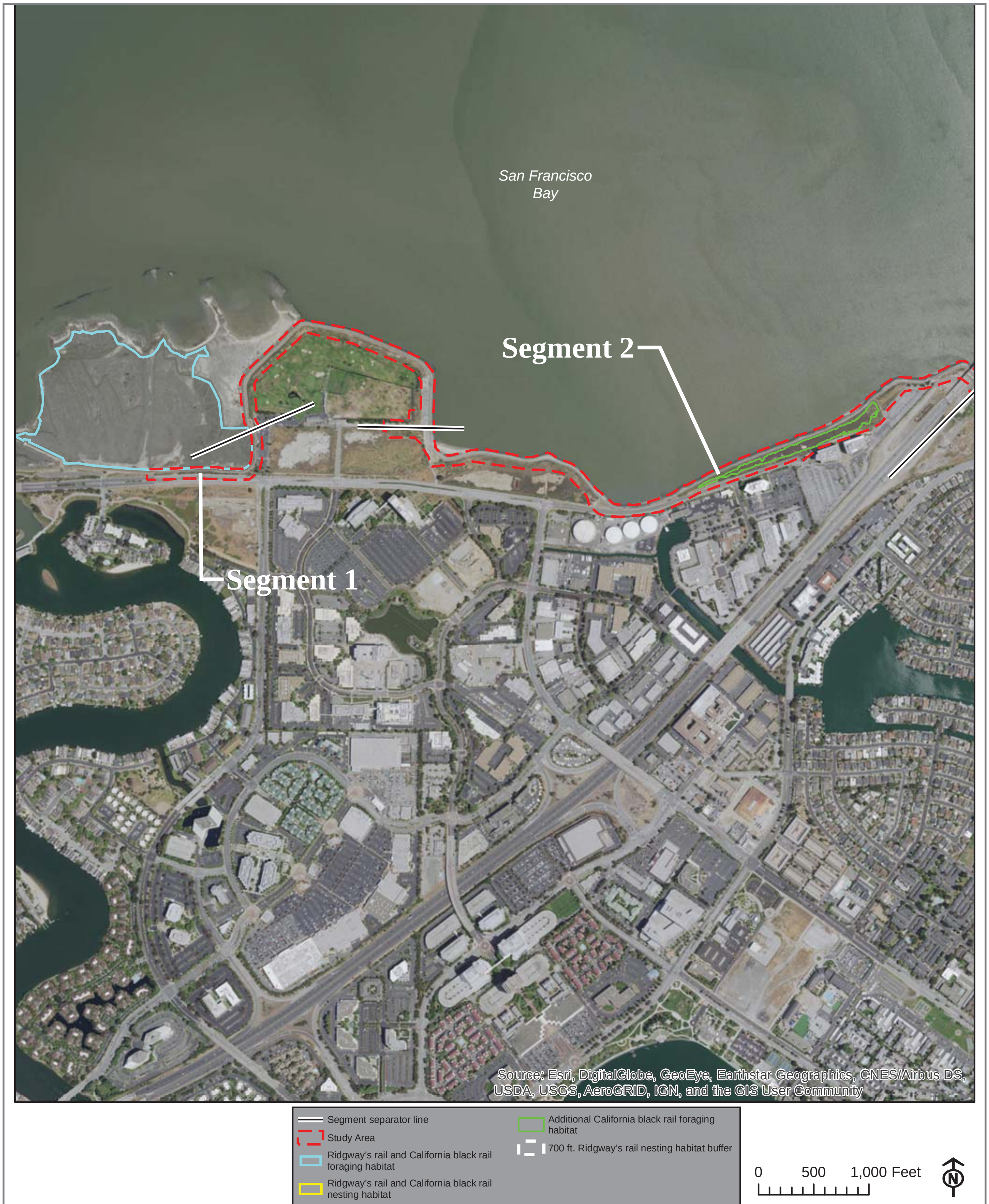
Source: Huffman Broadway Group, Schaaf & Wheeler, 2016

Figure V.C-3
Foster City Levee Protection Planning and Improvements Project EIR
Ridgway's Rail and California Black Rail Habitat Map (Levee Segments 4, 5, and 6)



Source: Huffman Broadway Group, Schaaf & Wheeler, 2016

Figure V.C-4
Foster City Levee Protection Planning and Improvements Project EIR
Ridgway's Rail and California Black Rail Habitat Map (Levee Segments 7 and 8)



Source: Huffman Broadway Group, Schaaf & Wheeler, 2016

Figure V.C-5
Foster City Levee Protection Planning and Improvements Project EIR
Ridgway's Rail and California Black Rail Habitat Map (Levee Segments 1 and 2)

California Black Rail

The California black rail (*Laterallus jamaicensis coturniculus*) is a state-listed threatened species and a California Fully Protected Species. The California black rail most commonly occurs in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrush in association with pickleweed. In freshwater marsh, they are usually found in bulrush, cattails, and saltgrass. These rails typically occur in the high wetland zones near the upper limit of tidal influence. In California, the species occurs at San Francisco Bay, the Sacramento-San Joaquin Delta, Morro Bay, the Salton Sea, and the lower Colorado River. Loss of upper marsh zone around San Francisco Bay has reduced numbers considerably.

The CNDDB reports occurrences of California black rail in Belmont Slough and O'Neill Sloughs. Nesting and foraging habitats for California black rail are generally consistent with areas that provide suitable nesting and foraging areas for Ridgway's rail. Thus, suitable nesting habitat for California black rail occurs in the salt marsh habitats adjacent to the levee in segments 5 (southern portion), 6, and 7 along Belmont Slough, and adjacent to the levee in the western half of segment 8 along O'Neill Slough (as shown in Figures V.C-3 and 4). Areas suitable for foraging by Ridgway's rail in segments 1, 4, and 5, and the eastern portion of segment 8 are also suitable as foraging areas by California black rail (as shown in Figures V.C-3, 4, and 5). In addition, the salt marsh area landward of the levee along segment 2, especially higher complexity habitat in the vicinity of the pedestrian bridge over the marsh, can provide suitable winter foraging area for California black rail (as shown in Figure V.C-5).

Western Snowy Plover

Western snowy plover is a federally listed threatened species and designated as a species of special concern in California. Western snowy plover is a small bird that lives in sandy coastal beaches, salt pans, coastal dredged spoils sites, dry salt ponds, salt pond levees and gravel bars. Nests typically occur in flat, open areas with sandy or saline substrates and sparse vegetation. The Western snowy plover is present in California in fall and winter, common on sandy marine and estuarine shores, uncommon at salt ponds and areas at the Salton Sea. The species nests locally in these habitats from April through August, but the major nesting habitat now appears to be on salt pond levees, especially in San Francisco Bay.

The CNDDB shows that the Western snowy plover has occurred within salt evaporation ponds in the vicinity of Belmont Slough. Adult birds were noted in 1972 and 1978 and nesting was documented in 1975 and 1976. Western snowy plover has also been known to occur at Bair Island where they occurred in salt evaporation ponds on Middle Bair Island and at Outer Bair Island. It was not ascertained whether Western snowy plovers observed here were nesting. There are currently no salt ponds (suitable nesting habitat for Western snowy plover) anywhere along the levee in Belmont Slough. Appropriate nesting habitat is not present anywhere in the project vicinity. Occasional foraging by the species within the Foster City Lagoon Dredge Disposal Site may be possible when this area is not completely inundated. Foraging by the species is also possible in the areas free of marsh vegetation west of the Golf Center and bayside of the levee in segment 1.

California Least Tern

The California least tern is a federally listed endangered species. The species is also listed as endangered by the State of California and is a California Fully Protected Species.

Most California least terns begin breeding in their third year. Mating begins in April or May and nesting starts shortly after this in colonies on relatively open beaches kept free of vegetation by natural scouring from tidal action. No nesting habitats occur within any areas in the vicinity of the Foster City levee. Roosting by this species during the nesting season and especially during post-breeding dispersal has been noted occasionally at the Foster City Shell Bar adjacent to segment 3.

(3) Special-Status Fish Species

Key special-status fish species that are either known to occur within the project area, have a potential to occur at the site, or that require specific study to determine presence/absence, are discussed below.

Steelhead Trout – Central California Coast Distinct Population Segment

Steelhead (federally listed as threatened) have been known to migrate through San Francisco Bay to various creeks, but distribution studies that would allow a forecast of the number of individuals of steelhead that could wander to the area in the vicinity of the project site during the migration has not been conducted. The nearest area where this species is known to spawn is San Mateo Creek, the mouth of which is approximately 1 mile northwest of levee segment 1. According to the National Marine Fisheries Service (NMFS), steelhead trout may use marinas, creeks, and sloughs on the bayshore for resting or foraging during migration, and these areas may include the bay or Belmont Slough in the vicinity of Foster City levee project. Nevertheless, the number of individuals of this species of fish actually passing in the vicinity of the project site is projected to be small.

Green Sturgeon – Southern Distinct Population Segment

Green sturgeon is a federally listed threatened species. Little is known about the movements and habits of green sturgeon. Adults migrate upstream into rivers between late February and late July, and spawn between March and July, when the water temperature is 46–57°F. Peak spawning occurs from mid-April to mid-June. They are present in the Delta year-round, but their abundance, at least in the south Delta, is low. Because of the lack of study of green sturgeon in the southern San Francisco Bay, it is hard to determine whether they would be present in the project site and vicinity. If they are present, they would be in small numbers.

Longfin Smelt

Longfin smelt is a state-listed threatened species and a candidate for federal listing. Although longfin smelt spawn primarily in the lower reaches of the Sacramento and San Joaquin Rivers and spend their first year in the area of Suisun Bay, longfin smelt could occur in small numbers within San Francisco Bay in the vicinity of Belmont Slough near the project site, especially in deeper water habitats and especially during wet years.

2. Regulatory Framework

The following is a description of federal, State, and local environmental laws and policies that are relevant to the CEQA review process.

a. Federal Regulations

(1) Clean Water Act-Section 404

The USACE regulates discharges of dredged or fill material into waters of the U.S. under Section 404 of the Clean Water Act (CWA). "Discharge of fill material" is defined as the addition of fill material into waters of the U.S., including but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; and fill for intake and outfall pipes and sub-aqueous utility lines (33 C.F.R. Section 328.2(f)). In addition, Section 401 of the CWA (33 USC 1341) requires any applicant for a federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification that the discharge would comply with the applicable effluent limitations and water quality standards.

The USACE and the EPA are responsible for implementing the Section 404 program. Section 404(a) authorizes the USACE to issue permits, after notice and opportunity for comment, for discharges of dredged or fill material into waters of United States. Section 404(b) requires that the USACE issue permits in compliance with EPA guidelines, which are known as the Section 404(b)(1) Guidelines. Specifically, the Section 404(b)(1) guidelines require that the USACE only authorize the "Least Environmentally Damaging Practicable Alternative" (LEDPA) and include all practicable measures to avoid and minimize impacts to the aquatic ecosystem. The guidelines also prohibit discharges that would cause significant degradation of the aquatic environment or violate state water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Wetlands are defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR Section 328.3(b)).

Furthermore, Jurisdictional Waters of the U.S. can be defined by exhibiting a defined bed and bank and Ordinary High Water Mark (OHWM). The OHWM is defined by the USACE as “that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (33 CFR Section 328.3(e)).

Tidal waters are also under the jurisdiction of the USACE. The landward limits of jurisdiction in tidal waters extend to the high tide line…“or, when adjacent non-tidal waters of the United States are present, to the limits of jurisdiction for such non-tidal waters” (33 CFR Section 328.4(b)) High tide is further defined to include the line reached by spring high tides and other high tides that occur with periodic frequency (33 CFR Section 328.3(d)).

All wetlands in the study area were reviewed to determine if they could be disclaimed from USACE jurisdiction as isolated wetlands following two recent US Supreme Court decisions. In *Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers (SWANCC), No. 99-1178 (2001),* some isolated wetlands may be excluded from USACE Section 404 jurisdiction because they are (1) non-tidal, (2) non-navigable, (3) not hydrologically connected to navigable waters or adjacent to such waters, and (4) not subject to foreign or interstate commerce.

Subsequent to SWANCC, the U.S. Supreme Court decided on *Rapanos v. United States* and *Carabell v. United States*, 126 U.S. 2208 (2006) (herein referred to as Rapanos). In 2007, guidance was given to EPA regions and USACE districts to implement the Supreme Court’s decision which addresses the jurisdiction over waters of the U.S. under the Clean Water Act. The Rapanos guidance requires the USACE to conduct detailed analysis of the functions and values of wetlands and other waters of the U.S. potentially on-site and in some cases off-site, determine if there is a nexus to traditional navigable waters and the significance of the nexus to the traditional navigable water. Neither the Court nor the recently issued guidance draw a clear line with regard to the geographic reach of jurisdiction, particularly in drainages where flows are ephemeral and where wetlands are adjacent to but not directly abutting relatively permanent water, such as the wetlands delineated on the study site.

(2) Federal Endangered Species Act

The United States Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. The FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend. The FESA establishes an official listing process for plants and animals considered to be in danger of extinction; requires development of specific plans of action for the recovery of listed species; and restricts activities perceived to harm or kill listed species or affect critical habitat (16 USC 1532, 1536).

The FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined as harassing, harming (including significantly modifying or degrading habitat), pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species, or any attempt to engage in such conduct (16 USC 1532, 50 CFR 17.3) Taking can result in civil or criminal penalties. Federal regulation 50 CFR 17.3 further defines the term harm in the "take" definition to mean any act that actually kills or injures a federally listed species, including significant habitat modification or degradation. Additionally, the FESA prohibits the destruction or adverse modification of designated critical habitat. In the Service's regulations at 50 CFR 402.2, destruction or adverse modification is defined as a "direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species.

The FESA also requires federal agencies to ensure that their actions do not jeopardize the continued existence of listed species or adversely modify critical habitat (16 USC 1536). Therefore, the FESA is invoked when the property contains a federally listed threatened or endangered species that may be affected by a permit decision. In the event that listed species are involved and a USACE permit is required for impacts to jurisdictional waters, the USACE must initiate consultation with USFWS (or NMFS) pursuant to Section 7 of the FESA (16 USC 1536; 40 CFR § 402). If formal consultation is required, USFWS or NMFS would issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species, recommending reasonable and prudent measures to ensure the continued existence of the species, establishing terms and conditions under which the project may proceed, and authorizing incidental take of the species.

(3) Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSFA) conserves and manages the fishery resources found off the coasts of the United States, the anadromous species, and the Continental Shelf fishery resources of the United States, including the conservation and management of highly migratory species through the implementation and enforcement of international fishery agreements. The NMFS enforces the MSFA and regulates commercial and recreational fishing and the management of fisheries resources. The Sustainable Fisheries Act of 1996 amended the MSFA to include new fisheries conservation provisions by emphasizing the importance of fish habitat in regards to the overall productivity and sustainability of U.S. marine fisheries (Public Law 104-267). The revised MSFA mandates the identification and protection of Essential Fish Habitat (EFH) for managed species during the review of projects conducted under federal permits that have the potential to affect such habitat. Federal agencies are required to consult with NMFS on all actions or proposed actions authorized, funded, or undertaken by the agency, which may adversely affect EFH (MSFA 305.b.2).

Under the MSFA, NMFS identifies, conserves, and enhances EFH for those species regulated under a federal fisheries management plan (FMP). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity and includes all associated physical, chemical and biological properties of aquatic habitat that are used by fish. Projects that have the potential to adversely affect EFH must initiate consultation with NMFS. Adverse effects are any impacts that reduce the quality and/or quantity of EFH and can include direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810). There are four FMPs in California, Oregon, and Washington that identify EFH for groundfish, coastal pelagic species, Pacific salmon, and Pacific highly migratory fisheries.

(4) Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act is administered by the USFWS. The Act provides that it is unlawful to: pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product unless permitted by regulations. Most bird species within California fall under the provisions of the Act. Excluded species include nonnative species such as house sparrow, starling, and ring-necked pheasant and native game species such as quail.

(5) Fish and Wildlife Coordination Act

The USFWS also has responsibility for project review under the Fish and Wildlife Coordination Act. This statute requires that all federal agencies consult with USFWS, NMFS, and the state's wildlife agency (CDFW) for activities that affect, control, or modify streams and other water bodies. Under the authority of the Fish and Wildlife Coordination

Act, USFWS, NMFS, and CDFW review applications for permits issued under Section 404 and provide comments to the USACE about potential environmental impacts.

b. State Regulations

(1) California Endangered Species Act

The State of California enacted the California Endangered Species Act (CESA) in 1984. The CESA is similar to the FESA but pertains to state-listed endangered and threatened species. CESA requires state agencies to consult with the CDFW when preparing CEQA documents to ensure that the state lead agency actions do not jeopardize the existence of listed species. CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur, and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. Agencies can approve a project that affects a listed species if they determine that "overriding considerations" exist; however, the agencies are prohibited from approving projects that would result in the extinction of a listed species.

The CESA prohibits the taking of state-listed endangered or threatened plant and wildlife species. CDFW exercises authority over mitigation projects involving state-listed species, including those resulting from CEQA mitigation requirements. CDFW may authorize taking if an approved habitat management plan or management agreement that avoids or compensates for possible jeopardy is implemented. CDFW requires preparation of mitigation plans in accordance with published guidelines.

(2) Section 401 of the Federal Clean Water Act/Porter Cologne Water Quality Act

Pursuant to Section 401 of the Federal Clean Water Act, projects that require a USACE permit for the discharge of dredge or fill material must obtain water quality certification that confirms a project complies with State water quality standards before the USACE permit is valid. State water quality is regulated/administered by the State Water Resources Control Board and the nine Regional Water Quality Control Boards (RWQCBs). The state also maintains independent regulatory authority over the placement of waste, including fill, into waters of the State under the Porter-Cologne Act.

The California State Water Resource Control Board has developed a general construction storm water permit to implement the requirements for the federal National Pollution Discharge Elimination System (NPDES) permit. The permit requires submittal of a Notice of Intent to comply, fees, and the implementation of a Storm Water Pollution Prevention Plan (SWPPP).

(3) McAteer-Petris Act

The San Francisco Bay Conservation and Development Commission (BCDC) has permit jurisdiction over San Francisco Bay. There are two types of BCDC jurisdiction within the Bay Area. They are further described below.

San Francisco Bay Jurisdiction

San Francisco Bay jurisdiction includes all areas that are subject to tidal action from the south end of the bay to the Golden Gate (Point Bonita-Point Lobos) and to the Sacramento River line (a line between Stake Point and Simmons Point, extended north easterly to the mouth of Marshall Cut), including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level (msl); tidelands (land lying between mean high tide and mean low tide); and submerged lands (land lying below mean low tide).

Shoreline Band Jurisdiction

Shoreline band jurisdiction consists of all territory located between the shoreline of San Francisco Bay and a line 100 feet landward of and parallel with that line; provided that BCDC may, by resolution, exclude from its area of jurisdiction any area within the shoreline band that it finds and declares is of no regional importance to the bay.

BCDC is authorized to issue or deny permits for any filling of the bay. Section 66605 of the McAteer-Petris Act allows the Commission to authorize bay fill only for water-oriented uses, and minor fill to improve shoreline appearance or public access. Furthermore, the McAteer-Petris Act requires that the fill only should be authorized if there is no feasible upland location, the fill is the minimum amount necessary, the fill minimizes harmful effects to the bay, and the public benefits clearly exceed its detriments. The proposed project would require a BCDC permit for shoreline improvements within a 100-foot band from Belmont Slough and San Francisco Bay.

(4) California Department of Fish and Wildlife Species of Special Concern

CDFW tracks species in California whose numbers, reproductive success, or habitat may be threatened. Even though not formally listed under FESA or CESA, such plant and wildlife species receive additional consideration during the CEQA process. Species that may be considered for review are included on a list of “Species of Special Concern” developed by the CDFW. CDFW has also designated special-status natural communities which are considered rare in the region, support special-status species or otherwise receive some form of regulatory protection. Documentation pertaining to these communities, as well as special-status species (including species of special concern), is kept by CDFW as part of the CNDDB.

(5) California Department of Fish and Wildlife – Streambed Alteration Agreement

Section 1602 of the California Fish and Game Code requires any person, governmental agency, or public utility proposing any activity that would divert or obstruct the natural flow or change the bed, channel or bank of any river, stream, or lake, or proposing to use any material from a streambed, to first notify CDFW of such proposed activity. CDFW may propose reasonable modifications, based on the information contained in the notification form and a possible field inspection, CDFW may propose reasonable modifications in the proposed construction as would allow for the protection of fish and wildlife resources. Upon request, the parties may meet to discuss the modifications. If the parties cannot agree and execute a Lake and Streambed Alteration Agreement, then the matter may be referred to arbitration.

(6) California Department of Fish and Wildlife – Fish and Game Code Sections 3503 and 3503.5

Section 3503 of the Fish and Game Code makes it unlawful to take, possess, or needlessly destroy the nests or eggs of any bird. Section 3503.5 makes it unlawful to take or possess birds of prey (hawks, eagles, vultures, owls) or destroy their nests or eggs.

(7) California Department of Fish and Wildlife – Fully Protected Animals

The classification of Fully Protected was an effort by the State of California in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Most Fully Protected species have also been listed as threatened or endangered species under state endangered species laws and regulations. Species classified as Fully Protected Species by the CDFW may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of the bird species for the protection of livestock (as per California Fish and Game Code Section 3511(a)(1)).

c. Local Regulations

(1) City of Foster City General Plan

In addition to federal and state regulations, the development of the property must be accomplished consistent with the land use designations and natural resource and other policies of the City of Foster City General Plan. The General Plan Conservation Element acknowledges that "in 1974 a 57-acre wildlife sanctuary was set aside in exchange for a permit to fill 382 acres of seasonal wetlands elsewhere in Foster City. The wildlife refuge is roughly bounded by Belmont Slough on the east, Beach Park Boulevard on the west, and between Tarpon Street and Foster City Boulevard. The tidal wetlands and mudflats in this area contain feeding and resting habitat for numerous and diverse migratory shorebirds and some species of waterfowl who migrate along the Pacific flyway." This wildlife sanctuary is immediately adjacent to the proposed project.

Policies in the Conservation Element related to biological resources include the following:

- *Policy C-6 Wildlife Habitat.* Protect the wildlife habitat located in the wildlife refuge, 100-foot regulated shoreline band, wetland areas and the Foster City Lagoon System.
- *Policy C-y Wetland Habitat.* Protect wetland habitat from human disturbance by posting signs prohibiting trespassing on vegetation typical of wetland areas.
- *Policy C-z 57-Acre Wildlife Refuge.* Prohibit development within 57-acre wildlife refuge.
- *Policy C-aa Projects in the Vicinity of Shoreline Band.* Strictly control development proposals in the vicinity of the shoreline band.

3. Impacts and Mitigation Measures

This subsection discusses the potential impacts on biological resources that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the biological resources impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on biological resources if it were to:

- 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 CDFW or USFWS.
- 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 CDFW or USFWS.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- 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.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

b. Less-than-Significant Biological Resources Impacts

Discussed below are the less-than-significant biological resources impacts that could result from development of the proposed project.

(1) Special-Status Plant Species

The proposed project would not result in any significant adverse impacts on special-status plant species as special status plants do not occur within the project site or the project site vicinity.

(2) Special-Status Animal Species

The proposed project would not result in any significant adverse impacts on the Western snowy plover and California least tern, as described below.

Western Snowy Plover and California Least Tern

Two federally listed species have the potential for occasional occurrence in the vicinity of the Foster City levee: the federally listed threatened Western snowy plover and the federally listed endangered California least tern.

Although Western snowy plover was documented within salt evaporation ponds in the vicinity of Belmont Slough in the 1970s, no salt ponds currently occur in the vicinity of the Foster City levee and no nesting habitat is currently found in the vicinity of the project area. Occasional foraging by the species within the Foster City Lagoon Dredge Disposal Site (west of the southern portion of segment 5 and north of the eastern portion of segment 6) may be possible when this area is not completely inundated. Foraging by the species is also possible in the areas free of marsh vegetation west of the Mariners Point Golf Center and bayside of the levee in segment 1. The construction of the proposed levee improvements would have no direct or indirect impact on the Western snowy plover.

Likewise, no nesting habitats for California least tern occur within any areas in the vicinity of the Foster City levee; however this species has occasionally been sighted during the nesting season and especially during post-breeding dispersal at the Foster City Shell Bar adjacent to segment 3. The construction of the proposed levee improvements would have no direct or indirect impact on California least tern.

(3) Special-Status Fish Species

The proposed project would not result in any significant adverse impacts on special status fish species, as described below.

Listed species of salmonids such as steelhead, or other listed fish species such as green sturgeon and longfin smelt, may pass through San Francisco Bay during their annual migrations. None of the special-status fish species mentioned (steelhead trout, green sturgeon or longfin smelt) spawn in the portion of San Francisco Bay located along the Foster City shoreline, and although any of these species could be found offshore at certain times of the year, their number would be very small.

Listed species of fish in the bay or adjacent sloughs could possibly be impacted by (1) in-water work along the shoreline of San Francisco Bay and Belmont Slough during construction, (2) unmitigated erosion resulting in an increase in turbidity and siltation that could stress respiratory function in fish, or (3) excessively loud construction operations such as pile-driving that may result in noise levels and vibration that at high levels could result in physical harm or behavioral impacts to individuals of listed fish that may be present in the area. If potentially significant impacts to fish populations are possible, limiting construction work to periods when fish are least likely to be present (June 1 to November 30) is a possible mitigation.

A potential for impacts to special-status fish species resulting from levee construction would be an increase in turbidity and siltation that in the worst case could stress respiratory function in fish. Green sturgeon and longfin smelt would not be likely to suffer adverse impacts from increased turbidity as both are species that occur in deeper portions of the water column and are adapted to higher levels of turbidity. Species like longfin smelt actually seek refuge from predators by seeking turbid waters. Minor turbidity impacts to steelhead would be addressed with Best Management Practices (BMPs) (including use of silt fence or straw wattles along the shoreline to control sedimentation in runoff) which are proposed as part of the project description.

In addition to the use of BMPs during project construction, the project description includes several other elements that are intended to minimize project impacts on listed species of salmonids and other listed fish species in adjacent waters. As the proposed levee improvements are planned to extend the toe of the levee slope on the landward side of the levee, the proposed levee construction does not involve in-water work. Although the project requires installation of sheet pile walls to accomplish flood protection, the project proposes vibratory hammering methods to drive the sheet piles into the existing levee rather than traditional pile-driving methods that could result in higher levels of noise and vibration and that could impact fish populations in adjacent waters. In addition, sheet piles would be installed in upland areas (through portions of existing levee) using land-based equipment to minimize sound and vibration levels in bay waters.

NMFS has concluded that the levee improvement project as proposed would not warrant establishment of a work window allowing construction only during certain times of the year to protect listed fish species (personal communication with Gary Stern, Supervising Fish Biologist with NOAA Fisheries/NMFS, July 2016). A work window would not be necessary as long as the project included the following items (all currently included as part of the project description): (1) sheet piles would be installed in uplands (into the existing levee) using land-based equipment; (2) sheet piles would be installed using vibratory hammering methods; (3) there would be no in-water work; (4) the contractor would use BMPs to control erosion and sedimentation into adjacent waters; and (5) widening of the toe of the slope of the levee, if necessary, would be accomplished on the landward side of the levee if at all possible. NMFS indicated that details regarding a complete mitigation program for the proposed project would be developed as part of an eventual Endangered Species Act Section 7 consultation and EFH consultation.

Construction of the proposed levee improvements would not result in impacts to fish migration habitat or impacts to either the Steelhead Trout-Central California Coast Distinct Population segment (DPS), Green Sturgeon-Southern DPS, or to longfin smelt.

(4) Conflict with Local Policies or Ordinances Protecting Biological Resources

The project would not conflict with local policies or ordinances of the City of Foster City relevant to tree preservation or other biological resource issues.

(5) Conflict with Provisions of an Adopted Habitat Conservation Plan, Natural Community Conservation Plan or Other Approved Local, Regional, or State Habitat Conservation Plan

There are no adopted or approved Habitat Conservation Plans or Natural Community Conservation Plans relevant to the project site.

c. Significant Biological Resources Impacts

Development of the proposed project could result in significant impacts related to special-status animal species, riparian habitats, or other sensitive natural communities, federally protected wetlands, and movement of native fish or wildlife species or established native resident or migratory wildlife corridors, as discussed below.

(1) Special-Status Animal Species

Impact BIO-1: The Levee project could result in significant impacts to special-status animal species, including the Ridgway's rail, salt marsh harvest mouse, and California black rail. (S)

The proposed project could result in significant impacts on special-status animal species, including the federally listed endangered Ridgway's rail and salt marsh harvest mouse and the state-listed threatened California black rail. These three species occur in salt marsh habitats along the San Francisco Bay shoreline in San Mateo County, including both Belmont and O'Neill Sloughs. Pacific Coast Salt Marsh habitats consisting of pickleweed and, in some areas, cordgrass vegetation occur adjacent to the levee in a number of locations, including segment 1 and the entire length of the levee alignment along Belmont Slough and O'Neill Slough from the southern portion of segment 4 through segment 8. Various areas of Pacific Coast Salt Marsh along the levee alignment may constitute nesting or foraging habitats for Ridgway's rail or California black rail as described below. All areas of the salt marsh along Belmont and O'Neill Sloughs may be suitable habitat for the salt marsh harvest mouse.

The main potential impacts to Ridgway's rail are as a result of (1) construction activities creating potential disturbances to nesting or foraging Ridgway's rail, or (2) impacts related to use of sheet pile walls at the top of the levee that can restrict movements of Ridgway's rail, especially when seeking cover from predators at retreat sites during extreme high tides. Similar construction impacts and potential impacts related to the use of sheet pile walls during extreme high tides are possible for California black rail, as well. The main impacts to salt marsh harvest mouse are similar, with the main potential impacts related to (1) direct impacts to potential salt marsh harvest mouse habitat or indirect disturbance to mice during construction, or (2) impacts related to use of sheet pile walls at the top of the levee that can restrict movements of mice, especially when seeking cover from predators at retreat sites during extreme high tides. As the Ridgway's rail and salt marsh harvest mouse occupy similar habitat areas, and the types of impacts and recommended mitigation measures are the same for both project scenarios, the impacts and mitigation discussions below address both species.

Ridgway's Rail

Potentially suitable nesting habitat for Ridgway's rail can be found adjacent to the bayside of the levee along Belmont Slough in the southern half of segment 5, segments 6 and 7, and the western half of segment 8, and suitable foraging habitats can be found adjacent to the bayside side to the levee along segment 1, the southern portion of segment 4, the northern portion of segment 5 and the eastern half of segment 8 (as shown in Figures V.C-3, 4, and 5). Direct impacts to habitat for Ridgway's rail are possible in areas where construction work takes place within the salt marsh habitat for the species. Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), direct fill impacts to wetlands (0.48 acres for the 2050 Sea Level Rise scenario and 1.15 acres for the 2100 Sea Level Rise scenario) by design would occur on the landward side of the levee instead of on the bayside of the levee. Therefore, no fill within salt marsh on the bayside of the levee would occur, and no direct impacts to nesting or foraging habitat for Ridgway's rail would result from project construction.

Although no direct impacts to the salt marsh habitat of Ridgway's rail would occur, if a Ridgway's rail was present in or near the work area, it could be disturbed by the operation of equipment and the activities of work crews conducting construction activities at that site. Such indirect disturbance could cause Ridgway's rail to disperse, could result in harassment, harm or even mortality, or could cause them to remain more susceptible to predation during high tide events. In addition, some impact to Ridgway's rail habitat may be possible adjacent to nesting or foraging areas where loss of vegetation associated with construction of the levee itself could result in removal of some transitional upland vegetation that could support Ridgway's rail during extreme high tides in the winter when individuals of this species seek refugial habitats in the high marsh or adjacent upland transition area.

As suitable Ridgway's rail breeding or nesting habitat occurs in the project area and nesting habitat occurs within 700 feet of the proposed levee improvements, there is the potential for nesting disturbance. Such disturbance could result from the activities of construction crews involved in activities associated with the construction of the levee work. Noise and other disturbances could disrupt nesting and breeding activity, as well as other behaviors associated with foraging, reproduction, and other essential activities engaged in by the species. Construction activity near nests could cause nest abandonment, reduced care for young or eggs, or increased dispersal with subsequent potential increases in predation.

Indirect impacts to nesting Ridgway's rail, especially during construction activity, are possible. Use of construction equipment within the area of the levee along Belmont Slough has the potential to result in disturbances to nests within 700 feet of the construction activity. As shown in Figure V.C-3, nesting habitat for Ridgway's rail occurs in the southern half of segment 5, segments 6 and 7, and the western half of segment 8 (Figure V.C-4), and the 700-foot setback from suitable nesting habitats encompasses all portions of the levee from Shorebird Park in segment 4 to O'Neill Slough in segment 8.

To comply with USFWS requirements, either the construction activity would need to occur at a time during the year when the Ridgway's rail would not be expected to be nesting, or a protocol breeding survey for Ridgway's rail would need to be conducted prior to any construction work planned during the nesting season. If nesting surveys are conducted, the results of the surveys must be provided to the USFWS. Nesting locations for Ridgway's rail, as determined during protocol surveys, would need to be protected by a 700-foot setback and planned construction operations within 700 feet of active nests would not be able to proceed. Construction in some areas within 700 feet of suitable nesting habitat could move forward if protocol surveys demonstrated there were no active Ridgway's rail nests within 700 feet of the planned construction activity.

To the extent possible, the City of Foster City proposes to conduct construction activity associated with improvements to the levee in segments 4 (south of Shorebird Park), 5, 6, 7, and 8 (which include potentially suitable nesting habitat for Ridgway's rail) between September 1 and January 31 (the allowed work window to avoid impacts to nesting Ridgway's rail). If construction is confined to the period between September 1 and January 31, the nesting season of Ridgway's rail would be avoided and this would preclude the need for nesting season surveys. No construction operations would proceed along Belmont Slough between Shorebird Park and the terminus of segment 8 at Highway 101 within the nesting season unless protocol surveys determine the exact location of active Ridgway's rail nests so that construction operations can be planned to ensure protection of all active nests with setbacks of at least 700 feet.

Additional impacts to Ridgway's rail are possible because of the installation of a sheet pile wall along the levee (sheet piles are proposed in both project scenarios: 2050 Sea Level Rise and 2100 Sea Level Rise). Upland transition areas provide important refugial habitat for Ridgway's rail during extreme high tides that occur in the winter months (also referred to as "king tides"). The installation of sheet pile walls along the levee has the potential to prevent rails from finding suitable vegetated refugial areas when they are forced from the marsh plain by rising tides and need to seek cover from predators in high marsh or transitional upland vegetation during these extreme tide events. The installation of sheet pile walls along all salt marsh providing suitable Ridgway's rail nesting or foraging habitat could render individuals of Ridgway's rail more susceptible to predation during these extreme high tide events.

Under the 2050 Sea Level Rise scenario, sheet piles are proposed for installation adjacent to habitat for Ridgway's rail for the entirety of the length along Belmont and O'Neill Sloughs, with the exception of the portions of segments 5 and 6 along the border of the City's Phase II Sedimentation Basin where an earthen levee is proposed. Under this scenario, earthen levee is also proposed along segment 1. Under the 2100 Sea Level Rise Scenario, sheet piles would be installed all along Belmont and O'Neill Sloughs (including along the City's Phase II Sedimentation Basin) and also adjacent to the Ridgway's rail foraging habitat found along segment 1. One way of mitigating the impacts resulting from installation of sheet pile adjacent to Ridgway's rail habitat is to require the contractor to plant additional high marsh vegetation, such as gum plant (*Grindelia* sp.) along the bayside of the sheet pile wall to provide additional much needed cover from predators.

Additional predation could result from installation of sheet pile walls because the wall itself could provide perching sites for common ravens, red-tailed hawks, Peregrine falcons or other birds of prey who could hunt for prey such as Ridgway's rail during the high tides. This impact can be mitigated through installation of predator prevention devices on the sheet pile wall.

Despite the City's intent to comply with work windows or conduct protocol surveys to avoid impacts to nesting Ridgway's rail, other mitigation measures are recommended to protect the Ridgway's rail during construction phase of the project such as environmental awareness training of all construction personnel, preconstruction surveys, and use of biological monitors during construction activities near the marsh. With implementation of **Mitigation Measures BIO-1a and -1b** described below, potential project construction impacts to Ridgway's rail would be reduced to a less-than-significant impact.

Salt Marsh Harvest Mouse

Salt marsh harvest mouse has never been found along the Peninsula shoreline north of the San Mateo-Hayward Bridge. However, the species has been documented from O'Neill Slough (in the salt marsh adjacent to segment 8), and suitable habitat for salt marsh harvest mouse occurs in all areas of the marsh adjacent to the levee along the south end of segment 4 (south of Shorebird Park) and all of segments 5 through 8. Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), direct fill impacts to wetlands (0.48 acres for the 2050 Sea Level Rise scenario and 1.15 acres for the 2100 Sea Level Rise Scenario) by design would occur on the landward side of the levee instead of the bayside of the levee.

Proposed levee improvements include increased levee height that would involve extension of the toe of the slope of the levee only on the landward side of the levee to the extent feasible. As salt marsh harvest mouse habitat is found only bayside of the levee, no direct impacts to habitat for salt marsh harvest mouse is anticipated. The only possibility of direct impact to salt marsh harvest mouse habitat may be adjacent to suitable habitat areas where loss of vegetation associated with construction of the levee itself could result in removal of some transitional upland vegetation that could support salt marsh harvest mouse during extreme high tides in the winter when individuals of this species seek refugial habitats in the high marsh or adjacent upland transition area.

Although no direct impacts to the salt marsh habitat of salt marsh harvest mouse are expected to occur, if a salt marsh harvest mouse was present in or near the work area, salt marsh harvest mice could be disturbed by the operation of equipment and the activities of work crews conducting construction activities at that site. Such indirect disturbance could cause salt marsh harvest mice to disperse, could result in harassment, harm or even mortality, or could cause them to remain more susceptible to predation during high tide events.

Additional impacts to salt marsh harvest mouse are possible because of the installation of a sheet pile wall along the levee (sheet piles are proposed in both scenarios: 2050 Sea Level Rise and 2100 Sea Level Rise). Upland transition areas provide important refugial habitat for salt marsh harvest mouse during extreme high tides that occur in the winter months (also referred to as “king tides”). The installation of sheet pile walls along the levee has the potential to prevent mice from finding suitable vegetated refugial areas when they are forced from the marsh plain by rising tides and need to seek cover from predators in high marsh or transitional upland vegetation during these extreme high tide events.

Under the 2050 Sea Level Rise scenario, sheet piles are proposed for installation adjacent to habitat for salt marsh harvest mouse for the entirety of the length along Belmont and O’Neill Sloughs, with the exception of the portions of segments 5 and 6 along the border of the City’s Phase II Sedimentation Basin. Under the 2100 Sea Level Rise Scenario, sheet piles would be installed all along Belmont and O’Neill Sloughs (including along the City’s Phase II Sedimentation Basin). Sheet pile walls would also be installed along segment 1, but the salt marsh here is not considered suitable habitat for salt marsh harvest mouse as the species has never been encountered on the Peninsula shoreline north of the San Mateo Bridge/SR 92. One way of mitigating this potential impact is to require the contractor to plant additional high marsh vegetation, such as gum plant (*Grindelia* sp.) along the bayside of the sheet pile wall to provide additional much needed cover from predators. Additional predation could result from installation of sheet pile walls because the wall itself could provide perching sites for common ravens, red-tailed hawks, Peregrine falcons or other birds of prey who could hunt for prey such as salt marsh harvest mouse during the high tides. This impact can be mitigated through installation of predator prevention devices on the sheet pile wall.

Precautions need to be taken to ensure that indirect impacts to salt marsh harvest mice that may wander near the construction area during project implementation or to habitat for the species do not occur. The project includes the use of exclusion fencing to ensure mice do not migrate into the construction zone during construction activity. In addition, mitigation measures are also recommended to protect the salt marsh harvest mouse during the implementation phase of the project including pre-construction surveys, environmental awareness training of all construction personnel and use of biological monitors during construction operations near the marsh. With implementation of **Mitigation Measures BIO-1a and -1b** described below, potential project construction impacts to salt marsh harvest mouse would be reduced to a less-than-significant impact.

California Black Rail

Nesting and foraging habitats for the state-listed threatened California black rail are generally consistent with areas that provide suitable nesting and foraging areas for Ridgway's rail. California black rail has been known to occur in Belmont Slough and O'Neill Slough, and all areas noted above as nesting and/or foraging habitat for Ridgway's rail along Belmont and O'Neill Sloughs would be considered suitable habitat for California black rail. Any construction proposed along Belmont Slough or O'Neill Slough during the nesting season for Ridgway's rail (February 1 to August 31) would require that protocol surveys for Ridgway's rail be conducted to determine presence/absence of Ridgway's rail in areas of potential nesting habitat within 700 feet of construction activity. Any such protocol surveys conducted prior to nesting season construction in these areas would also include surveys for California black rail. Preconstruction surveys by biological monitors in areas of suitable Ridgway's rail foraging habitat (e.g., adjacent to segment 1) would also include preconstruction surveys for California black rail. In addition, the palustrine emergent marsh located landward of the levee in segment 2 was not included among the areas described as suitable habitat for Ridgway's rail, but this marsh area could serve as appropriate winter foraging habitat for California black rail. Use of a biological monitor during construction when work is conducted in the vicinity of this marsh would ensure that no harm to California black rail occur during construction activities. With implementation of **Mitigation Measures BIO-1a and -1b** as described below, potential project construction impacts to California black rail along Belmont Slough and O'Neill Slough would be reduced to a less-than-significant level.

<u>Mitigation Measure BIO-1a</u>: In order to minimize potential effects to salt marsh harvest mouse, Ridgway's rail, and California black rail and their habitats, the City of Foster City Public Works Department and/or the project team shall implement the following:

a. To the extent feasible, levee construction in segment 4 (south of Shorebird Park), 5, 6, 7, and 8 shall be conducted between September 1 and January 31 to avoid the nesting season of the Ridgway's rail. If construction work is proposed after January 31 or prior to September 1, protocol surveys for Ridgway's rail shall be conducted to determine the extent and location of nesting Ridgway's rail. Results of protocol breeding surveys shall be submitted to the U.S. Fish and Wildlife Service (USFWS) for a determination of whether work proposed within 700 feet of a Ridgway's rail nest (or the activity center of vocalizing Ridgway's rails) discovered during such surveys should be rescheduled to occur during the period from September 1 to January 31. Protocol surveys conducted between January 31 and September 1 shall include nesting surveys for California black rail. Results of surveys for California black rail shall be submitted to California Department of Fish and Wildlife (CDFW) to determine if setbacks are warranted to protect nesting California black rail.

b. A qualified biological monitor(s) shall be present during all construction work taking place adjacent to salt marsh providing suitable habitat for Ridgway's rail, California black rail, and salt marsh harvest mouse in segments 4 (south end) 5, 6, 7 and 8. A biological monitor(s) shall also be present during construction work taking place adjacent to suitable foraging habitat for rails in the marsh adjacent to segment 1 and the marsh landward of levee segment 2 that provides potentially suitable winter foraging habitat for California black rail. The monitor(s) are to have demonstrated experience in monitoring sensitive resource issues on construction projects and knowledge of the biology of salt marsh harvest mouse, Ridgway's rail, and California black rail. Prior to the initiation of construction, qualifications of the prospective biological monitor(s) shall be submitted to the USFWS for review and approval. The monitor(s) will have the authority to halt construction, if necessary, when noncompliance actions occur. The biological monitor(s) shall be the contact person for any employee or contractor who might inadvertently kill or injure a listed species or anyone who finds a dead, injured, or entrapped listed species.

c. Exclusion fencing shall be placed around the bayside of the defined work area prior to the start of construction activities to prevent salt marsh harvest mice from moving into affected areas. The fence shall be made of a material that does not allow harvest mice to pass through, and the bottom shall be buried so that mice cannot crawl under the fence. All supports for the exclusion fencing shall be placed on the landward side of the fence.

d. Prior to commencement of construction activity each day in segments 1, 4 (south end), 5, 6, 7, and 8, and near marsh habitats landward of segment 2, the biological monitor(s) shall conduct a preconstruction survey of the anticipated construction zone for that day to ensure that salt marsh harvest mice, Ridgway's rail or California black rail not present within the work area.

e. The biological monitor(s) shall provide an endangered species training program to all personnel involved in project construction. At a minimum, the employee education program must consist of a brief presentation by persons knowledgeable about Ridgway's rail, California black rail, and salt marsh harvest mouse biology and legislative protection to explain concerns to contractors, their employees, and agency personnel involved with implementation of the project. The program shall include the following: a description of the three species and their habitat needs, any reports of occurrences in the action area; an explanation of the status of the Ridgway's rail, California black rail, and salt marsh harvest mouse and their protection under state or federal Endangered Species Acts; and a list of measures being taken to reduce impacts to these species during the work. Fact sheets containing this information shall be distributed to all involved in the training.

f. If any rail or mouse species is observed at any time during construction, work will not be initiated or will be stopped immediately by the biological monitor(s) until the rail or mouse leaves the vicinity of the work area on its own volition and the USFWS is notified. If the rail or mouse does not leave the work area, work shall not be reinitiated until the USFWS is contacted and has made a decision on how to proceed with work activities. The biological monitor(s) shall direct the contractor on how to proceed accordingly. The biological monitor(s) or any other persons at the site will not pursue, capture, handle or harass any rail or mouse observed.

g. Biological monitor(s) shall ensure that construction work is scheduled to avoid extreme high tides when there is potential for salt marsh harvest mice to move to higher, drier grounds. All equipment will be staged on existing roadways away from the project site when not in use.

h. All personnel and any equipment shall be required to stay within the designated work sites and access corridors to perform job-related tasks, and shall not be allowed to enter adjacent salt marsh wetlands, drainages, and habitat of listed species. Pets shall not be allowed in or near the work site. Firearms shall not be allowed in or near the work sites. No intentional killing, harassment, or injury of wildlife shall be permitted. The work sites shall be maintained in a clean condition. All trash (e.g., food scraps, cans, bottles, containers, wrappers, cigarette butts, and other discarded items) shall be placed in closed containers and properly disposed of off-site on a daily basis. Trash cans shall be "bear proof" to reduce the amount of waste available to vermin and other predators. No fires shall be permitted in any of the work sites.

i. Interpretative signage shall be placed along the Bay Trail to encourage public awareness of wetlands ecology, endangered species life histories, species/predator interactions, and how predation of sensitive species can be minimized. Additional signs shall be placed at various points to remind users of the Bay Trail with respect to a prohibition on dogs within the project area during the construction phase of the project.

j. Use of the Bay Trail along the shoreline shall be limited to pedestrians, bicycles, and battery operated wheelchairs or other similar mechanisms associated with access for disabled individuals.

k. Appropriate erosion control materials such as silt fence and straw rolls will be installed as needed during construction activities within the project area.

l. Hazardous materials used during the work period (e.g., fuels, lubricants, solvents, etc.) shall be controlled, cleaned up, and properly disposed of outside the tidal marsh areas. Refueling areas for any equipment will be located at upland sites outside of wetlands.

m. After construction, a final clean-up would include removal of all refuse generated by the work. Vegetation would not be removed or disturbed in the clean-up process.

n. If requested, before, during, or upon completion of construction, the contractor shall allow access by USFWS personnel to the work areas to inspect effects, if any, of the actions on the salt marsh harvest mouse or Ridgway's rail.

o. Subsequent to construction, the contractor shall submit a compliance report, prepared by the biological monitor(s), to the USFWS within 60 days after completion of the work. This report will detail the dates the work occurred; information concerning the success of the actions in meeting the recommended mitigation measures; any effects on the salt marsh harvest mouse and Ridgway's rail; documentation of the worker environmental awareness training; and any other pertinent information.

<u>Mitigation Measure BIO-1b</u>: In order to minimize potential effects to salt marsh harvest mouse, Ridgway's rail, and California black rail resulting from installation of sheet pile walls in areas adjacent to suitable habitats for these species, the City of Foster City Public Works Department, and/or the project team shall implement the following:

a. To provide high tide refuge and cover for Ridgway's rail, California black rail, and salt marsh harvest mouse, vegetation shall be planted along the bayside of the sheet pile wall in all areas adjacent to salt marsh habitats where sheet pile is installed along the levee. A Detailed Vegetation Planting Plan shall be submitted to the USFWS within 60 days of the start of construction. The Detailed Vegetation Planting Plan shall include establishment of high marsh vegetation (including the planting of gum plant and pickleweed), monitoring period, performance criteria, and erosion control measures.

b. Nixalite spikes or other USFWS-approved perching prevention device will be applied to the top of the sheet pile wall in all areas of the levee where sheet pile walls are installed adjacent to salt marsh habitats. (LTS)

Implementation of **Mitigation Measures BIO-1a** and **BIO-1b** would ensure that potential impacts to salt marsh harvest mouse, Ridgway's rail, and California black rail would be less than significant.

(2) Riparian Habitat or Other Sensitive Natural Community

<u>Impact BIO-2</u>: Project construction could introduce invasive, non-native plants into the project area. (S)

The levee improvements are generally designed so that in areas where an extension in the height of the levee would require extension of the toe of the fill slope, this extension would occur on the landward side of the levee to avoid impacts to the salt marsh habitats and regulatory wetlands located in many areas on the bayside of the levee (e.g., along segment 1, and along Belmont Slough in segments 4 (southern portion), 5, 6, and 7, and O'Neill Slough in segment 8). With the improvements proposed on the landward side of the levee, most impacts resulting from construction of the levee improvements would impact Urban habitat types, affecting vegetation such as ice plant and landscaping species. Some removal of non-native grasses and herbaceous species would also occur in many areas. Such impacts to Non-native Grassland and Urban habitats vegetated with non-native grasses and herbaceous species and landscaping species would not be considered significant.

Sheet pile floodwalls would be used among most of the alignment specifically to limit impacts to wetlands where there is insufficient right-of-way width or where encroachment may occur into wetland areas with an earthen levee or conventional floodwall. Under the 2050 Sea Level Rise scenario, nearly all impacts to Pacific Coast Salt Marsh Habitats (total of 0.48 acres) would occur either in segment 2 or near the junctions of segments 5 and 6 (small impacts also occur in northern portion of segment 5). Under the 2100 Sea Level Rise Scenario, nearly all impacts to Pacific Salt Marsh Habitat (a total of 1.15 acres) would occur in segment 2, segment 3 (near Bridgeview Park), and segments 5 and 6 (near the City's Phase II Sedimentation Basin), with additional small impacts along Belmont or O'Neill Slough in segments 7 and 8. Details regarding impacts to these wetlands and waters of the U.S. are discussed below under (3) federally protected wetlands as defined by Section 404 of the Clean Water Act.

The staging areas at the City's corporation yard, in the vicinity of San Mateo Bridge/SR 92, and along Beach Park Boulevard are either pavement or landscaping, and significant vegetation impacts would not result from use of these areas for staging activities associated with construction of levee improvements. Use of the staging area along the north and west edges of the City's Dredge Disposal Site may result in temporary impacts to vegetation consisting almost exclusively of non-native plants and grasses. It is not anticipated that staging activities would result in any impacts to landscape trees present along the border of Sea Cloud Park. Staging activities would occur in the vicinity of mitigation wetlands found adjacent to the proposed staging area, and potential indirect impacts to these wetlands and associated wildlife habitats and recommended mitigation measures can be found in the discussion under (4) Substantial Interference with Fish or Wildlife Movement, Wildlife Corridors, or Wildlife Nursery Sites.

Invasive, exotic weeds compete with native vegetation and can degrade the quality of wildlife habitats. Project landscaping and construction activity has the potential to introduce invasive, exotic, non-native vegetation, some of which may not now exist in the area. Also, construction projects provide a pathway for dispersal of invasive plants. Invasive plant species include those designated as noxious weeds by the U.S. Department of Agriculture, problem species listed by the California Department of Food and Agriculture, and other invasive plants designated by the California Invasive Plant Council. Where appropriate, vegetation removed as a result of project activities should be replaced with native species which are of value to local wildlife. Native plants generally are more valuable as wildlife food sources and require less irrigation, fertilizers, and pesticides than exotic species. With implementation of **Mitigation Measure BIO-2**, potential impacts to riparian habitat or other sensitive natural communities would result in a less-than-significant impact.

> Mitigation Measure BIO-2: Landscaping will be designed to enhance the wildlife value and aesthetic quality of undeveloped portions of the project site. Where appropriate, vegetation removed as a result of project activities will be replaced with native species which are of value to local wildlife, and native vegetation will be retained. If deemed necessary by the Public Works Department, weed management practices shall be implemented, including identification and removal of infestations of noxious weeds prior to construction, use of construction equipment and materials such as fill and erosion control devices that are known to be weed-free, power washing of construction vehicles to remove mud, dirt and vegetative material before working in relatively weed-free areas, and removal of invasive species from areas within the project boundary set aside for open space uses. (LTS)

Implementation of **Mitigation Measure BIO-2** would ensure that the proposed project has a less-than-significant impact associated with riparian habitats or other sensitive natural communities.

(3) Federally Protected Wetlands as Defined by Section 404 of the Clean Water Act

Impact BIO-3: The Levee project would permanently impact federally protected wetlands under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario. (S)

Table V.C-3 shows the acreage of existing wetlands within each levee segment, compared with the acreage of wetlands impacted under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise).

Under the 2050 Sea Level Rise scenario, the construction of the levee improvements and extension of the toe of the levee slope on the landward side of the levee would permanently impact 0.48 acres of Palustrine Emergent Wetlands in segment 2 and near the junctions of segments 5 and 6, with minor impacts also occurring in the northern portion of segment 5.

TABLE V.C-3 IMPACTS TO WETLANDS AND WATERS OF THE U.S. FOR LEVEE IMPROVEMENTS IN LEVEE SEGMENTS FOR PROJECT SCENARIOS

Levee Segment	Existing Wetlands within the Study Area (Acres)	Wetlands Impacted – 2050 Sea Level Rise Scenario (Acres)	Wetlands Impacted – 2100 Sea Level Rise Scenario (Acres)
Segment 1	0.36	0	0
Area between Segment 1 and Segment 2	2.42	0	0
Segment 2	4.67	0.34	0.34
Segment 3	2.34	0	0.08
Segment 4	0.70	0	0
Segment 5	3.02	0.003	0.38
Segment 6	1.73	0.14	0.34
Segment 7	0.96	0	0.002
Segment 8	0.81	0	0.001
Total	**17.01**	**0.48**	**1.15**

Source: HBG, 2016

Under the 2100 Sea Level Rise scenario, the construction of the levee improvements and extension of the toe of the levee slope on the landward side of the levee would permanently impact 1.15 acres of Palustrine Emergent Wetlands in segment 2, segment 3 (near Bridgeview Park), and segments 5 and 6 (near the City's Phase II Sedimentation Basin), with additional small impacts along Belmont and O'Neill Slough in segments 7 and 8.

These impacted wetlands are potentially under the jurisdiction of the USACE under Clean Water Act Section 404 or Rivers and Harbors Act Section 10. Figures showing the locations of all impacts to areas potentially subject to USACE jurisdiction can be found in the Biological Assessment (Appendix C).

Fill within the jurisdictional areas would require a CWA permit from the USACE. The required permit is likely to be a Nationwide Permit (NWP) under the 2050 Sea Level Rise scenario. As the fill impacts are estimated to exceed 0.5 acres under the 2100 Sea Level Rise scenario, the required permit would likely be an Individual Permit. NWPs apply to waters of the U.S. regulated by Section 404 of the CWA and Section 10 of the RHA. A Section 401 Water Quality Certification from San Francisco Bay RWQCB would be necessary for the USACE permit to be valid. Without mitigation, project impacts to wetlands or waters of the U.S. would be significant. However, with implementation of **Mitigation Measure BIO-3**, potential impacts to federally protected wetlands would be reduced to a less-than-significant level.

Mitigation Measure BIO-3: The City of Foster City Public Works Department and/or the project team shall submit applications for a Section 404 Clean Water Act permit from the USACE and for a Section 401 water quality certification from San Francisco Bay RWQCB, required for the USACE permit to be valid. Under the 2050 Sea Level Rise scenario, impacts would be less than 0.5 acres (estimated at 0.48 acres) and the permit from USACE is anticipated to be a Nationwide Permit. Under the 2100 Sea Level Rise Scenario, the impacts of greater than 0.5 acres (estimated at 1.15 acres) would require that the City obtain an Individual Permit from USACE. It is anticipated that applications for these permits would be submitted to the respective agencies sometime in early 2017. Appropriate wetland mitigation would be required by the USACE and RWQCB for impacts to the 0.48 acres of Palustrine Emergent Wetland under the 2050 Sea Level Rise scenario and for impacts to 1.15 acres of Palustrine Emergent Wetland under the 2100 Sea Level Rise scenario. A wetland mitigation plan to mitigate impacts to jurisdictional areas shall be developed as part of the USACE and RWQCB permit process. USACE jurisdictional areas must be replaced at a minimum 1:1 ratio through wetland creation (preferably at a Mitigation Bank) to ensure that no net loss of acreage or functions and values to these areas occurs. The required ratio of replacement acreage to impacted acreage is decided by regulatory agencies on a project-specific basis based on the functions and values present on the project site, but requirement for a mitigation ratio of 2:1 (estimated at 0.96 acres for the 2050 Sea Level Rise scenario, and 2.3 acres for the 2100 Sea Level Rise scenario) would be likely.

To offset the wetland impacts, the Permittee shall either: (1) purchase mitigation credits equivalent to 0.96 acres (2050 Sea Level Rise scenario) or 2.3 acres (2100 Sea Level Rise scenario) from an authorized mitigation bank; or (2) implement a Permittee-responsible mitigation plan and establish or restore wetlands within uplands along the levee alignment. If Permittee-responsible mitigation is implemented, a detailed mitigation plan shall be prepared that includes monitoring and reporting requirements, responsibilities, performance standards, reporting procedures, contingency plan, and plan to ensure long-term protection through real estate instruments or other available mechanisms, as appropriate. A Permittee-responsible mitigation plan shall consider means of incorporating an ecotone levee or horizontal levee feature consisting of a gently sloped levee designed to mimic the transition from wetlands to uplands and that shall provide flood protection, wildlife habitat (including transitional and refugial habitat for Ridgway's rail and salt marsh harvest mouse) as well as water quality benefits. Such a levee may be feasible in areas adjacent to the

City's Phase II Sedimentation Basin in the southern portion of segment 5 and the eastern portion of segment 6. (LTS)

Implementation of **Mitigation Measure BIO-3** would ensure that the proposed project has a less-than-significant impact related to federally protected wetlands.

(4) Substantial Interference with Fish or Wildlife Movement, Wildlife Corridors, or Wildlife Nursery Sites

<u>Impact BIO-4</u>: **Project construction involving vegetation removal during the bird nesting season could result in bird mortality or nest failure, and project construction could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. (S)**

The Foster City levee is primarily within an Urban Habitat with sensitive habitats in adjacent areas including Pacific Coast Salt Marsh. Adjacent habitats such as the marshes of Belmont and O'Neill Sloughs, the open waters of San Francisco Bay, and especially the Foster City Shell Bar, provide quality habitats for a variety of wildlife species. Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), construction could result in the removal of some vegetation that could support special-status species such as salt marsh harvest mouse and Ridgway's rail during extreme high tides in the winter when individuals of these species seek refugial habitats in the high marsh and perhaps adjacent uplands (especially the bayside of the levee from the south end of segment 4 through segment 8).

For both project scenarios and throughout the project, most of the vegetation affected by the levee improvements consists of non-native grasses and landscaping species, and removal of this vegetation would result in only minor disruptions for regularly occurring wildlife species. Such disruptions include potential elimination of some bird roosting, nesting, and foraging areas or displacement of various species of reptiles, amphibians, and small mammals (including California ground squirrels that burrow into the levee at some locations) to remaining undisturbed areas. Undeveloped properties near the levee would be capable of accommodating the few species that may be displaced by construction. Limiting construction involving extension of the toe of the levee slope to the landward side of the levee and away from important habitats along both Belmont and O'Neill Sloughs and the bayshore, including the Foster Shell Bar, would help ensure that wildlife impacts are kept to a minimum.

Nesting Birds

Nesting bird species protected by the federal Migratory Bird Treaty Act could be impacted during project construction. Although work related to levee improvements along levee segments 4 (south end), 5, 6, 7, and 8 is planned to occur during the period between

September 1 and January 31, which is outside the nesting season for migratory birds, work on levee segments 1, 2, 3 and most of 4 is proposed to occur at any time of year. Work within levee segments 1 through 4 involving the removal of trees, shrubs, or other vegetation during the February 1 to August 1 breeding season of birds could result in mortality or nest failure of nesting avian species if they are present. Such impacts could also occur with use of the 3.93-acre construction staging area proposed on the perimeter levee for the Foster City Phase II Sedimentation Basin if activities occurred during the bird nesting season. Many species of raptors (birds of prey) are sensitive to human incursion and construction activities, and it is necessary to ensure that nesting raptor species would not be present in the vicinity of construction sites. Therefore, mitigation measures are recommended below.

> <u>Mitigation Measure BIO-4a</u>: If feasible, construction work shall take place outside of the February 1 to August 1 breeding window for nesting birds. If construction is to be conducted during the breeding season, a qualified biologist shall conduct a pre-construction breeding bird survey in areas of suitable habitat within 15 days prior to the onset of construction activity. If bird nests are found, appropriate buffer zones shall be established around all active nests to protect nesting adults and their young from construction disturbance. Size of buffer zones shall be determined in consultation with wildlife agency staff based on site conditions and species involved. Buffer zones shall be maintained until it can be documented that either the nest has failed or the young have fledged. (LTS)

Water Quality

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), construction activities on the project site would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff, as further discussed in *Section V.H, Hydrology and Water Quality*. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters outside of the project site, resulting in degradation of water quality.

Construction of levee improvements is proposed to occur immediately adjacent to wetlands in many locations. Such locations include the bayside of the levee for the entirety of the shoreline of San Francisco Bay, Belmont Slough and O'Neill Slough, locations where wetlands are present along the landward side of the levee (e.g., portions of segment 2, segment 3 adjacent to wetlands south of Bridgeview Park, segments 5 and 6 adjacent to the City's Phase II Sedimentation Basin), and along existing wetlands (including mitigation wetlands) at the proposed staging area within the western and northern perimeter levee for the Phase II Sedimentation Basin, including a short section adjacent to the main Foster City Lagoon. Grading, placement of fill material and other ground-disturbing activities associated with construction of levee improvements could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream, resulting in indirect impacts to wetlands and potential impacts to fish and wildlife resources. In the absence of water quality controls, indirect impacts to adjacent wetlands and resident animal populations could result from the proposed project due to elevated contaminants in stormwater runoff. The requirement for the implementation of a SWPPP, with identification of proper construction techniques and BMPs would minimize adverse effects associated with these activities. In particular, silt fence and straw wattles should be installed along both sides of the work area to protect adjacent wetlands and recreational areas from increased sedimentation.

> Mitigation Measure BIO-4b: Best Management Practices (BMPs) and all requirements as detailed in the Stormwater Pollution Prevention Plan (SWPPP) shall be implemented to control erosion and migration of sediments off-site. These requirements are necessary along the bayside of the levee for the entirety of the shoreline of San Francisco Bay, Belmont Slough and O'Neill Slough, locations where wetlands are present along the landward side of the levee (e.g., portions of segment 2, segment 3 adjacent to wetlands south of Bridgeview Park, segments 5 and 6 adjacent to the City's Phase II Sedimentation Basin), and along existing wetlands (including mitigation wetlands) at the proposed staging area within the western and northern perimeter levee for the Phase II Sedimentation Basin, including a short section adjacent to the main Foster City Lagoon. Implementation of water quality controls shall be consistent with the BMPs requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. Silt fences in combination with straw wattles shall be installed along both sides of the work areas mentioned above to protect adjacent wetlands from increased sedimentation. In addition, vegetation shall only be cleared from the permitted construction footprint. Areas cleared of vegetation, pavement, or other substrates shall be stabilized as quickly as possible to prevent erosion and runoff. (LTS)

Implementation of **Mitigation Measure BIO-4a and 4b** would ensure that the proposed project has a less-than-significant impact related to water quality.

Essential Fish Habitat

The project site is adjacent to an area identified as EFH under the Magnuson-Stevens Fishery Conservation and Management Act for various life stages of fish species managed with the following FMPs under the Act: the Pacific Groundfish FMP (various rockfishes, sole and sharks), the Pacific Salmon FMP (Chinook salmon, Coho salmon), and the Coastal Pelagic FMP (northern anchovy, Pacific sardine). In addition, the project occurs within an area designated as Habitat Areas of Particular Concern (HAPC) for various federally managed fish species within the Pacific Groundfish FMP. HAPC are described in the regulations as subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Designated HAPC are not afforded any additional regulatory protection under the Marine Sanctuaries Act (MSA); however, federal projects with potential adverse impacts to HAPC are more carefully scrutinized during the consultation process. As defined in the Pacific Groundfish FMP, San Francisco Bay, including the project area, is within estuary HAPC. Species that may be near the project area are, among other species, starry flounder (*Platichthys stellatus*), northern anchovy (*Engraulis mordax*), and Chinook salmon (*Oncorhynchus tshawytscha*).

EFH in the bay or adjacent sloughs could possibly be impacted by (1) in-water work along the shoreline of San Francisco Bay and Belmont Slough, (2) unmitigated erosion resulting in an increase in turbidity and siltation that in the worst case could stress respiratory function in fish, or (3) excessively loud construction operations such as pile-driving that may result in noise levels and vibration that at high levels could result in physical harm or behavioral impacts to fish species that may be present in the area. Restrictions on the project, as specifically enumerated in the project description, would ensure that impacts to special-status species of fish do not occur (see discussion under (1) Special-Status Animal Species). These restrictions include: (1) sheet piles would be installed in uplands (into the existing levee) using land-based equipment, (2) sheet piles would be installed using vibratory hammering methods, (3) there would be no in-water work, (4) the contractor would use BMPs to control erosion and sedimentation into adjacent waters, and (5) widening of the toe of the slope of the levee, if necessary, would be accomplished on the landward side of the levee if at all possible. With these restrictions included in the project, NMFS has indicated that limitations of the work to only certain periods of the year to protect fish species would not be warranted. These same restrictions would also ensure that any impacts to EFH would be reduced to less-than-significant levels.

Implementation of **Mitigation Measures BIO-4a and BIO-4b**, as well as adherence to the restrictions listed in the Project Description designed to minimize impacts to special-status fish species would ensure that the proposed project has a less-than-significant impact related to interference with fish or wildlife movement, wildlife corridors, or wildlife nursery sites.

d. Cumulative Biological Resources Impacts

Cumulative impacts for the project are viewed in the context of natural habitat areas that remain in the project area, future foreseeable development projects in the area, and any regional habitat preservation programs for the region. The project is proposed along the frontage of San Francisco Bay and Belmont Slough where salt marsh wetlands are subject to state and federal agency regulatory jurisdiction. These salt marsh habitats potentially support populations of special-status species including the federally listed endangered Ridgway's rail and salt marsh harvest mouse and state-listed species such as California black rail. Offshore areas within San Francisco Bay and Belmont Slough support small numbers of federally listed fish species such as steelhead and green sturgeon. A wildlife habitat preserve was established in 1974 that includes 57 acres of salt marsh area along Belmont Slough.

Avoidance measures are incorporated into the proposed project design to lessen impacts to wetlands such as widening the levee, when necessary, to the landward side of the levee instead of toward salt marshes lining the Bay and Belmont Slough. Avoidance measures such as restrictions on the methods of pile-driving of sheet piles are also included in the project design to ensure no significant impacts to special status fish species occurs. Mitigation measures are recommended herein to reduce impacts to Ridgway's rail, California black rail, and salt marsh harvest mouse, and these measures will ultimately be incorporated as Conservation Measures into a Biological Opinion produced by the USFWS under an Endangered Species Act Section 7 consultation. The combination of avoidance measures incorporated into project design, mitigation to protect species, and plans to provide 2:1 compensation for all impacts to wetlands (currently estimated at between 0.48 acres and 1.15 acres, depending on the project scenario) would ensure that no significant project-specific biological impacts result from implementation of the project, and that the project's contribution to cumulative impacts is less than significant.

Significant biological resources are found in the vicinity of Foster City and continued residential, commercial or recreational development may result in cumulative impacts to local flora and fauna. Such cumulative impacts could include future impacts to wetlands or special status species along the shoreline, an incremental loss of native vegetation and habitat, and release of sediments and urban contaminants from local runoff that could affect downstream fish and wildlife resources. Minor cumulative impacts to nesting and foraging habitat for species may occur from future construction activities, but will be mitigated with preconstruction surveys and other measures similar to those recommended for the proposed levee improvements. In addition, all future projects will be developed consistent with the policies and programs of the Foster City General Plan. The City's 2015 Draft EIR for the General Plan Update and Climate Action Plan, which included the levee improvement project, did not identify significant cumulative biological impacts from future development. Therefore, no mitigation measures are warranted to address cumulative impacts of the levee improvement project beyond the project-specific measures recommended in this Draft EIR.

D. CULTURAL RESOURCES

Cultural resources are defined as the remains and sites associated with human activities – including historic archaeological sites, historic buildings and structures, prehistoric and ethnohistoric Native American archaeological sites, tribal cultural resources, and elements or areas of the natural landscape that have traditional cultural significance.

Paleontological resources are the fossilized remains, traces (e.g., tracks), or imprints of organisms preserved in or on the earth's crust.

This section describes the environmental setting and existing conditions with regard to cultural, historic and paleontological resources as they relate to the proposed project site (the site); discusses the regulatory framework relevant to the project; assesses potentially significant impacts to cultural and paleontological resources as a result of the project; and provides mitigation measures, where appropriate, to address the identified significant impacts.[1]

1. Environmental Setting

a. Prehistory

Archaeological evidence indicates that human occupation of California began at least 11,000 years ago.[2] Early occupants appear to have had an economy based largely on hunting, with limited exchange, and social structures based on the extended family unit. In the greater San Francisco Bay Area, earliest sites tend to date to 7,000–8,000 B.C.[3] No sites have been found in the immediate area of Foster City that date to this time period. Linguistic evidence shows that inhabitants in the Bay Area were Pre-Hokan speakers

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[1] The following studies were referenced for this analysis: (1) E. Barrow 2016*. A Cultural Resources Survey for the Levee Protection Planning and Improvements Project, Foster City, San Mateo County, California*; (2) V. Beard 2016. *Historical Evaluation of Foster City and the Foster City Levee System, San Mateo County, California;* and (3) K. Finger 2015. Letter report regarding a paleontological record search conducted at the University of California Museum of Paleontology.

[2] L. Erlandson, T. Rick, T. Jones, and J. Porcasi 2007 One if by Land, Two if by Sea: Who Were the First Californians? In*: California Prehistory: Colonization, Culture, and Complexity* (pp 53-62) T. Jones and K. Klar, Editors. AltaMira Press. Lanham, MD.

[3] R. Fitzgerald, 1993 *Archaic Milling Cultures of the Southern San Francisco Bay Region.* Archives of California Prehistory 35. Coyote Press, Salinas. M. Hylkema, 2002 Tidal Marsh, Oak Woodlands, and Cultural Florescence in the Southern San Francisco Bay Region, In, *Catalysts to Complexity: Late Holocene Societies of the California Coast*, edited by J. Erlandson and T. Jones, Pp. 233-262. Cotsen Institute of Archaeology, University of California, Los Angeles; J. Meyer, and J. Rosenthal 1997. *Archaeological and Geoarchaeological Investigations at Eight Prehistoric Sites in the Los Vaqueros Reservoir Area, Contra Costa County, California.* Anthropological Studies Center, Sonoma State University Academic Foundation, Rohnert Park, California. R. Schwaderer, 1992 Archaeological Test Excavation at the Duncans Point Cave, CA-SON-348/H. In, *Essays on the Prehistory of Maritime California*, edited by T. Jones, pp. 51-77. Center for Archaeological Research at Davis No. 10. University of California, Davis.

between 8,000 and 6,000 B.C., but that by 4,000 B.C., Hokan languages had developed.[4] Archaeological evidence has shown that people inhabited the western Bay Area between 3,500 and 2,500 B.C.; however, little is known of their culture.[5]

Between 2,000 B.C. and A.D. 1, Penutian speakers began to migrate into the area from the lower Sacramento Valley.[6] Excavations on the Peninsula have suggested that later inhabitants had close ties to both eastern and northern Bay Area people.[7] No excavations have taken place within Foster City. Within this same time frame, about 300–500 villages developed along the San Francisco Bay shore. Archaeologists refer to this settlement and subsistence strategy as the Berkeley Pattern. The Berkeley Pattern traits are characterized as follows:

> *Technological skills and devices.* The minimally shaped cobble mortar and cobble pestle are employed as the virtually exclusive milling implements. Manos and metates, while sometimes present, are rare. The dart and atlatl are present, the atlatl being represented by rare engaging hooks usually of bone or antler. Chipped stone projectile points are less frequent than in the Windmiller Pattern, and nonstemmed forms predominate. There is a growing emphasis upon the bone industry during the temporal span of the pattern. Mammal bone is more commonly employed than bird bone. The polished stone industry does not appear to be as highly developed as it is with the Windmiller Pattern.
>
> *Economic modes.* As indicated by a high proportion of grinding implements in relation to projectile points and by the regional accumulation of large shell heaps, the Berkeley Pattern has a collecting emphasis. The acorn is probably the dominant staple. The large number of sites and great depths of deposit suggest a larger population than that supported by the Windmiller Pattern. There is no apparent emphasis upon either trade or wealth. The use of local material predominates. Trade goods, when they appear, are finished specimens, rather than raw material.
>
> *Burial and ceremonial practices.* The mortuary complex is rarely elaborated. Flexed burial with variable orientation occurs in village sites. Burial goods are mostly restricted to a few utilitarian items or to ornamental objects which are compatible with an interpretation of being part of a relatively unelaborate burial costume. Ceremonialism is indicated predominately by shamanism, that is, by the presence of single graves with objects compatible with known ethnographic "shaman's kits," e.g., quartz crystals, charmstones, bone whistles. Graves are sometimes accompanied by

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[4] M. Moratto, 2004. *California Archaeology.* Academic Press, San Francisco.
[5] Ibid.
[6] Ibid.
[7] Ibid.

bird and animal bone, occasionally by articulated portions of skeletons. Birds and animals sometimes are found as ceremonial burials.[8]

There was regional variability, but the essential characteristics of this pattern were still present to distinguish Berkeley Pattern sites from coeval patterns. Primarily, the Berkeley Pattern represents an influx of Penutian speakers from interior California. Archaeologically, this influx is characterized by cultural complexity and a more sedentary lifestyle, as shown by the large shellmounds that dotted the San Francisco Bay shoreline.[9]

From A.D. 300 to A.D. 500, until contact with Europeans, the Bay Area settlement subsistence strategy is identified as the Augustine Pattern. The Augustine Pattern does not represent an influx of a new culture like the Berkeley Pattern, but rather a cultural growth as represented by the introduced use of the bow and arrow and harpoon, tobacco use, and a change in burial practices. In addition, populations increased as did settlements. There is a greater emphasis on gathering practices, especially acorns. Status differentiation is evident as is the use of currency in the form of clam-shell disk beads.[10]

b. Ethnography

At the time of European settlement, the project vicinity was included in territory controlled by the Ssalson linguistic group of the Ohlone, though it was very close to the Lamchin linguistic group of the Ohlone.[11] The Ohlone were hunter-gatherers who lived in rich environments that allowed for dense populations with complex social structures.[12] They settled in large permanent villages about which were distributed seasonal camps and task-specific sites. Primary village sites were occupied throughout the year, and other sites were visited to procure particular resources that were abundant or available only during certain seasons. Sites often were situated near freshwater sources and in ecotones where plant life and animal life were diverse and abundant.

According to the ethnographic literature reviewed, no ethnographic sites are reported within the site vicinity.[13]

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[8] D. Fredrickson, 1973 Early Cultures of the North Coast Ranges, California. Doctoral dissertation, Department of Anthropology, University of California, Davis.

[9] Ibid.

[10] Moratto, 2004, op. cit.

[11] R. Levy, 1978. Costanoan. In *California* edited by R. Heizer, pp. 485-495. Handbook of North American Indians, Vol. 8, W. Sturtevant, general editor. Smithsonian Institution, Washington, D.C. R. Milliken, 1995. *A Time of Little Choice.* Ballena Press, Menlo Park.

[12] A. Kroeber, 1925. *Handbook of the Indians of California.* Bureau of American Ethnology, Bulletin 78, Smithsonian Institution, Washington, D.C.

[13] Ibid, Levy, 1978, op. cit.

c. History

In 1958, retired real estate developer, T. Jack Foster, Sr. and his partner, Richard Grant, took an option on 2,600 acres of former marsh land located east of the city of San Mateo, 20 miles south of San Francisco. This low-lying property was created by Arthur L. Whitney and E.B. Pond when they built a series of levees to hold back bay waters from their 5,000-acre tract. [14] Historically, the shoals surrounding the area were used extensively by the Morgan Oyster Company. The company went out of business in 1921, and its San Mateo beds were sold to the Pacific-Portland Cement Company, which erected a plant at the Port of Redwood City in 1924. A portion of the Whitney and Pond tract was purchased by William P.A. Brewer during the 1890s, and he established the San Mateo Ranch Dairy. The Brewers sold much of the dairy property, by that time known as Brewer's Island, to the Leslie Salt Refining Company in the 1940s. Leslie Salt had large holdings along both sides of San Francisco Bay, with a large refining plant located near Redwood City, just south of Brewer's Island.

Acting on the 1958 option, Foster purchased the 2,600 acres of swampy grazing land in 1960 and commenced the unparalleled task of creating buildable land. Grant was no longer involved in the project. Instead, Foster's three sons would work with their father. Over a three-year period, 18 million cubic yards of sand were dredged from the San Bruno Shoals and transported to Brewer's Island by barge to raise the ground level six feet. Foster relied on the expertise of engineering firm Wilsey, Ham & Blair, and soils consultants Dames & Moore to work out issues of subsidence and drainage. When the existing levees were inspected, they were found to be well maintained and required little work initially.[15]

The resulting land mass featured a system of levees and lagoons created primarily for drainage purposes that became a focal point for the new community. In 1961, a master plan was submitted to San Mateo County for the development of Foster City. The plan envisioned a completely self-contained community with diverse housing types, waterfront lots and parks, and marinas with accommodations for professional, commercial, and industrial enterprises and public services. The plan projected a population of 35,000 with 11,000 residential units and 10,000 jobs. Ultimately, Foster City comprised nine residential neighborhoods, a town center, and an industrial center. The neighborhoods were named One through Nine (although they were not built in numerical order); infrastructure for neighborhood One was developed in 1962 and construction began in 1963.

[14] San Francisco Chronicle, 1898. Lands Won Back From the Sea. *San Francisco Chronicle,* September 25, 1898.

[15] Foster, T. 2012. *The Development of Foster City*. Xlibris Corporation. Bloomington, Indiana.

In 1995, the Foster City levee were raised 18 inches after analysis of the levees was conducted by FEMA and Robert Born, consulting engineer.

2. Existing Conditions

This subsection contains information about cultural and paleontological resources within the vicinity of the project site, obtained from the California Historical Resources Information System's Northwest Information Center in Rohnert Park, the University of California Museum of Paleontology at Berkeley, the City of Foster City files, and a field survey of the area.

a. Cultural and Historic Resources

Small portions of the north end of the project site had been previously surveyed for the presence of cultural resources.[16] No records of cultural resources within 1 mile of the site were identified.

A field survey of the project vicinity found no prehistoric or historical archaeological resources[17]. The Foster City levee system is a historical resource, and it was evaluated as part of the cultural resource element of the EIR. The levee system was found eligible for inclusion in the California Register of Historical Resources (California Register)[18].. The California Register is maintained by the state Office of Historic Preservation.

b. Native American Consultation

In compliance with SB 18, the Native American Heritage Commission was contacted in writing in December 2015. Letters were also sent to the Amah Mutsun Tribal Band of Mission San Juan Bautista, the Costanoan Rumsen Carmel Tribe, the Indian Canyon Mutsun Band of Costanoan, the Muwekma Ohlone Indian Tribe of the San Francisco Bay Area, the Ohlone Indian Tribe, the Trina Marine Ruano Family, Jakki Kehl, and Linda G. Yamane. The Native American Heritage Commission had no knowledge of sacred sites in the project vicinity, and no other responses were received.

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[16] D. Chavez, 1979. Letter report regarding a Cultural Resources Evaluation for the East Third Avenue Widening project. Document S-3115 on file at the Northwest Information Center, Sonoma State University, Rohnert Park. D. Chavez 1981. Letter report regarding the San Mateo Redevelopment Plan EIR: Bay Meadows and Shoreline Areas. Document S-3166 on file at the Northwest Information Center, Sonoma State University, Rohnert Park.

[17] E. Barrow, 2016, op. cit.

[18] V. Beard, 2016, op. cit.

c. Paleontological Resources

There are no recorded fossil localities within 10 miles of the project site.[19]

3. Regulatory Framework

This subsection describes the federal, state, and local environmental laws and policies relevant to cultural resources.

a. Federal Regulations

(1) National Historic Preservation Act

Most regulations at the federal level stem from the National Environmental Policy Act (NEPA) and historic preservation legislation such as the National Historic Preservation Act (NHPA) of 1966, as amended. The NHPA established guidelines to "preserve important historic, cultural, and natural aspects of our national heritage, and to maintain, wherever possible, an environment that supports diversity and a variety of individual choice." The NHPA includes regulations specifically for federal land-holding agencies, but also establishes regulations (Title 36 of the Code of Federal Regulations, Section [Section] 800) that pertain to all projects funded, permitted, or approved by any federal agency and that have the potential to affect cultural resources. All projects subject to NEPA are also subject to compliance with Section 106 of the NHPA. The provisions of NHPA established a National Register of Historic Places (National Register), which is maintained through the National Park Service.

(2) American Religious Freedom Act

The American Indian Religious Freedom Act recognizes that Native American religious practices, sacred sites, and sacred objects have not been properly protected under other statutes. It established, as national policy, protection and preservation for traditional practices and beliefs, sites (including right of access), and the use of sacred objects. However, this law does not include provisions for compliance.

(3) Native American Graves and Repatriation Act

The Native American Graves Protection and Repatriation Act of 1990 protects Native American graves on federal and tribal lands and recognizes tribal authority over the treatment of unmarked graves; it also prohibits the selling of Native American remains. The law provides guidelines for the return of Native American human remains and cultural objects from any collection (museum, university, government) that receives federal

[19] K. Finger, 2015, op. cit.

funding. Civil and criminal penalties can be imposed for noncompliance and illegal trafficking of remains or sacred objects stolen from graves.

(4) Paleontological Resources Protection Act

The Federal Paleontological Resources Preservation Act of 2002 codifies the generally accepted practice of limited vertebrate fossil collection and limited collection of other rare and scientifically significant fossils by qualified researchers. Researchers must obtain a permit from the appropriate state or federal agency and agree to donate any materials recovered to recognized public institutions, where they will remain accessible to the public and to other researchers.

b. State Regulations

(1) California Environmental Quality Act

The California Environmental Quality Act (CEQA) is codified in Public Resources Code (PRC) Section 21000 et seq., and the CEQA Guidelines are codified in Title 14 of the California Code of Regulations (CCR), Section 15000 et seq. As amended in September 2014, CEQA requires that lead agencies determine whether projects may have significant effects on archaeological, historical, and tribal cultural resources.

This determination applies to resources that meet significance criteria qualifying them as "unique," "important," listed on the California Register, or eligible for listing on the California Register. The importance of a resource is measured in terms of criteria for inclusion on the California Register (14 CCR, Section 4852(a)) as listed below.

If the agency determines that a project may have a significant effect on a historical resource, the project is determined to have a significant effect on the environment, and these effects must be addressed. If a cultural resource is found not to be significant under the qualifying criteria, it need not be considered further in the planning process.

CEQA Guidelines (PRC Section 15064.5) specify the procedures to be followed in case of the discovery of human remains on non-federal land. The disposition of Native American burials falls within the jurisdiction of the Native American Heritage Commission.

CEQA also affords protection to paleontological resources. Appendix G of the CEQA Guidelines requires consideration of impacts to paleontological resources, stating that, "a project will normally result in a significant impact on the environment if it will...disrupt or adversely affect a paleontological resource or site or unique geologic feature except as part of a scientific study."

(2) California Register of Historical Resources

California state law provides for the protection of cultural resources by requiring evaluations of the significance of archaeological , historic, and tribal cultural resources identified in documents prepared pursuant to CEQA. A cultural resource is considered an important historical resource if it meets any of the criteria found in Section 15064.5(a) of the CEQA Guidelines, which are similar to those described under the NHPA. Historic properties listed, or formally designated as eligible to be listed, on the National Register are automatically listed on the California Register, as are state landmarks and points of interest. The California Register can also include properties designated under local preservation ordinances or those identified through local historical resource surveys. A resource may be important if it meets any one of the criteria below, or if it is already listed on the California Register or a local register of historical resources.

An important archaeological, historical, or tribal cultural resource is one which:

1. Is 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 United States.
2. Is associated with the lives of persons important to local, California, or national history.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values.
4. It has yielded, or may be likely to yield, information important to the pre-history or history of the local area, California, or the nation.

In addition to meeting one or more of the above criteria, eligibility for the California Register requires that a resource retains sufficient integrity to convey a sense of its significance or importance. Seven elements are considered key in considering a property's integrity: location, design, setting, materials, workmanship, feeling, and association.

(3) California Health and Safety Code

California Health and Safety Code Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the county coroner can determine whether the remains are those of a Native American. If the remains are determined to be Native American and not a recent burial, the coroner must contact the California Native American Heritage Commission.

(4) Public Resources Code

PRC Section 5097.5(a) specifies that a person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

(5) California Code of Regulations

Chapter 1 of 14 CCR 3 addresses paleontological and archaeological resources on lands administered by the California Department of Parks and Recreation, as follows:

- CCR Section 4307: Geological Features - No person shall destroy, disturb, mutilate, or remove earth, sand, gravel, oil, minerals, rocks, paleontological features, or features of caves.
- CCR Section 4308: Archaeological Features - No person shall remove, injure, disfigure, deface, or destroy any object of archaeological, or historical interest or value.

(6) Senate Bill 18

Senate Bill (SB) 18, which went into effect January 1, 2005, set forth requirements for local governments (cities and counties) to consult with Native American tribes to aid in the protection of traditional tribal cultural places through local land use planning. The intent of SB 18 is to provide California Native American tribes an opportunity to participate in local land use decisions at an early stage of planning for the purpose of protecting or mitigating impacts to cultural places. The purpose of involving tribes at these early planning stages is to allow consideration of cultural places in the context of broad local land use policy prior to the making of individual site-specific, project-level land use designations by a local government. Under SB 18, local governments are required to conduct consultation with California Native American tribes when a General Plan Amendment occurs or if open space is being developed for the first time.

(7) Assembly Bill 52

The Native American Historic Resource Protection Act (Assembly Bill [AB] 52) of 2015 is intended to reduce the potential for delay and conflicts between Native American and developers. AB 52 adds “tribal cultural resources” to the specific cultural resources protected under CEQA, requiring lead agencies to notify relevant tribes about development projects. It also mandates that lead agencies consult with tribes (if requested by the tribe) and sets the principles for conducting the consultation.

Projects subject to AB 52 are those that file a notice of preparation for an EIR or notice of intent to adopt a negative or mitigated negative declaration on or after July 1, 2015, although the Governor's Office of Planning and Research (OPR) has until July 1, 2016 to develop guidelines (and the NAHC has until then to inform tribes which agencies are in their traditional area). Until OPR guidelines are set forth, the office suggests addressing whether the project would cause a substantial adverse change in the significance of a tribal cultural resources as defined in PRC 21074.

Under AB 52, a tribal cultural resources is defined as a site, feature, place, cultural landscape (must be geographically defined in terms of size and scope), sacred place, and object with cultural value to a California Native American tribe that are either included or eligible for inclusion in the California Register or included in a local register of historical resources. Alternatively, the lead agency, supported by substantial evidence, chooses at its discretion to treat the resource as a tribal cultural resources.

4. Impacts and Mitigation Measures

This subsection discusses the potential impacts on cultural and paleontological resources that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the cultural and paleontological resources impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on air quality if it would:

- Cause a substantial adverse change in the significance of a historical resource as defined in PRC Section 15064.5.
- Cause a substantial adverse change in the significance of an archeological resource pursuant to PRC Section 15064.5.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Disturb any human remains, including those interred outside of formal cemeteries.
- Cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074.

b. Less-Than-Significant Cultural Resources Impacts

Implementation of the proposed project would result in one less-than-significant impact described below. Because this impact would not exceed the significance criteria described above, it does not require mitigation measures.

(1) Significance of a Historical Resource

The Foster City levee system appears eligible for inclusion on the California Register under California Register eligibility Criterion 1 as an example of the new town movement that changed the way communities were envisioned after World War II. Additionally, Criterion 3 is met because Foster City was an engineering feat that required coordination between planners, civic engineers, soil scientist, and builders, and resulted in a unique, man-made land mass and community that is unparallel in California, and possibly nationwide. As proposed, the project would not cause changes or introduce new elements that would directly or indirectly affect the levee system's significance. The levee system is similar to a highway that requires periodic maintenance to extend its period of use. The construction proposed for this project will not change the levee design or appearance in a substantive way, nor does the setting, feeling, or association of the levee system change. The proposed project would not cause a substantial adverse change in the significance of a historical resource as defined in PRC Section 15064.5.

c. Significant Cultural Resources Impacts and Mitigation Measures

The proposed project would result in three significant cultural resources impacts, as discussed below.

(1) Significance of an archaeological resource

<u>Impact CULT-1</u>: **The Levee project could cause a substantial adverse change in the significance of an archaeological resource. (S)**

There is no evidence of archaeological resources and no known archaeological resources nearby.[20] It is unlikely that buried archaeological deposits exist at the site that could be disturbed by the project[21]; however, if buried deposits were to be encountered, the following mitigation measure is provided (see Appendix D).

<u>Mitigation Measure CULT-1</u>: Protection of archaeological resources encountered during construction. If archaeological materials are discovered during the course of construction, all work in the vicinity of the find shall stop. Project personnel shall not

[20] Tom Origer & Associates, 2016. Cultural Resources Survey.
[21] Ibid.

collect, move, or otherwise alter archaeological materials. A qualified professional archaeologist shall be retained to assess the find and make recommendations regarding treatment. Upon completion of the assessment, the archaeologist shall prepare a report documenting the methods and results of the analysis. Any recommendations by the qualified professional shall be incorporated into a treatment plan that takes into account the nature and scope of the find and is implemented by the project contractor. (LTS)

(2) Destruction of a unique paleontological resources

Impact CULT-2: The Levee project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. (S)

A search of the database at the University of California's Museum of Paleontology at Berkeley found no recorded fossil localities within 10 miles of the project location; however, if fossil deposits were encountered, the following mitigation measure is provided.

Mitigation Measure CULT-2: Protection of paleontological resources encountered during construction. If paleontological specimens are discovered during the course of construction, all work within 25 feet of the find shall stop, and a qualified paleontologist shall be retained to document the discovery and evaluate the nature and significance of the find. Upon completion of the assessment, the paleontologist shall prepare a report documenting the methods and results, and provide recommendations for the treatment of the paleontological resources discovered. If needed, a treatment plan will be developed that takes into account the nature and scope of the find. (LTS)

(3) Disturbance of Human Remains

Impact CULT-3: The Levee project could directly or indirectly disturb human remains, including those interred outside of formal cemeteries. (S)

Mitigation Measure CULT-3: Protection of Human Remains encountered during construction. If human remains are encountered during construction, the following procedures shall be followed as required by PRC Section 5097.9 and Health and Safety Code Section 7050.5. If the coroner determines that the human remains are Native American, the Native American Heritage Commission shall be notified and a Most Likely Descendant shall be appointed by the commission. A qualified archaeologist, the City, and the Most Likely Descendant shall make all reasonable efforts to develop an agreement for the treatment of, with appropriate dignity, human remains and associated or unassociated funerary objects as outlined in the CEQA Guidelines (Section 15064.5(d)). The agreement shall take into account the appropriate excavation, removal, recordation, analysis, custodianship, and final disposition of the human remains and associated or unassociated funerary objects. (LTS)

(4) Significance of Tribal Cultural Resource

Impact CULT-4: The Levee project could cause an adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074. (S)

The Native American Heritage Commission has no record of sacred sites near the project location, and no responses were forthcoming from tribes notified of the project. However, if tribal cultural resources and/or human remains were to be discovered, the following mitigation measure is provided.

Mitigation Measure CULT-4: Protection of tribal cultural resources. Consultation with Native American tribes shall continue through completion of the project, pursuant to PRC Section 21074. Native American consultants shall be invited to monitor construction activities within culturally sensitive areas and shall be given the right to inspect sites where human remains are discovered and to determine the treatment and disposition of the remains. The City shall provide requested information and updates to the Native American consultants during the life of the project, including copies of site records, survey reports, or other environmental documents. (LTS)

E. SOILS, GEOLOGY, AND SEISMICITY

This section describes the soil, geologic, and seismic environment of the proposed project site (the site); discusses the state and local regulations related to geology, soils, and seismicity that are pertinent to the project; assesses potentially significant impacts from strong seismic ground shaking, differential settlement, seismic-related ground failure, and unstable or expansive soils as a result of the project; and provides mitigation measures, where appropriate, to address the identified significant impacts. The information provided in this section is based on a review of (1) site-specific geotechnical investigations (i.e., evaluations of the history and properties of site materials and structures); and (2) geologic reports and maps by the United States Geological Survey (USGS), California Geological Survey (CGS), City of Foster City, and others, as available.

1. Setting

The site setting is directly influenced by the composition of underlying earth materials and the physical and chemical processes that gave rise to their formation. The geology at the site involves ongoing processes that include the effects of hydrologic and seismic conditions as well as significant alterations caused by human activities.

a. Geologic Conditions

(1) Topography

The curvilinear 8-mile project site is located within an urbanized portion of eastern Foster City at the western margin of San Francisco Bay (the bay). The project site is underlain by artificial (i.e., man-placed) fill placed on the gently bayward[1] sloping tidelands (marsh and shallow near-shore environment) of the bay. Overall, the fill surface is relatively planar with the exception of low earthen berms constructed as levees at the bayward margin of the filled land. The tops (crests) of existing levees are generally less than 6 feet above the surrounding fill surface and have moderately steep to steep (4:1 [horizontal:vertical] to 2:1) sideslopes. The surface is also interrupted by depressions that define the Marina Lagoon (Seal Slough), the Foster City Lagoon, and Belmont Slough, as well as minor drainage channels. The existing ground surface elevation along the levee alignment

[1] The orientation of the shoreline of San Francisco Bay is variable at the project site and is reflected in the position of the existing and proposed levees. The orientation is generally north-facing in levee segments 1 and 2 (west of the San Mateo Bridge/SR 92); northeast-facing in segment 3; east-facing in segments 4 and 5 and a portion of segment 7; and south-facing in segment 6, a portion of segment 7, and segment 8 (along Belmont Slough).

ranges from approximately 11 to 13 feet above the North American Vertical Datum of 1988 (NAVD 88).

(2) Regional and Site-Specific Geology

The project site is located within the Coast Ranges geomorphic province, a relatively geologically young and seismically active region on the western margin of the North American plate.[2,3] In California, the Coast Ranges are sub-parallel to the Pacific Coast and extend from the Oregon border to the Transverse Ranges of southern California. The only major break in the geographic continuity of the Coast Ranges is the depression containing San Francisco Bay, along which the project site is located. Based on USGS mapping of the San Francisco Bay region, the project site is underlain by man-made artificial fills that have been placed at the site over young (recently deposited) Bay Mud at the margin of the bay.[4,5,6] The filled lands are at the bayward margin of a tidal plain that extends westward to the base of the eastern flank of the central Santa Cruz Mountains. The Bay Muds are predominantly very soft to firm fine-grained sediments (e.g., mixed clay, silt and sand) with interbedded coarser grained layers. The Bay Mud is usually underlain by more consolidated Old Bay Mud. At depth (tens to hundreds of feet), the old Bay Mud overlies Franciscan assemblage bedrock.

Site-specific geotechnical investigations have been conducted to provide information on the geologic and engineering conditions for levees within the project site and adjacent areas.[7,8] These investigations involved sampling of soil borings in and near the levee, visual and laboratory analysis of soil samples, topographic profiling, analysis of the stability of the levees, and hydrologic/hydraulic analysis.

The results of the testing are generally consistent with the USGS regional mapping and indicate that the subsurface along the alignment of the existing levees consists of an upper layer of approximately 1–10 feet of fill material. These man-placed deposits are predominantly firm to very stiff silty and sandy clays with some dense silty sand lenses or

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[2] California Geological Survey (CGS), 2002. California Geomorphic Provinces, Note 36.

[3] Norris, Robert M., Webb, Robert W., 1976. Geology of California, 2nd Edition, J. Wiley & Sons, Inc.

[4] Bay Mud is formed by the distribution of silt and clay throughout San Francisco Bay by estuarine currents. The silt and clay settles to the bottom during slack water periods and forms the fine-grained, water-saturated deposit called "Bay Mud." Bay Mud has low permeability and is generally rated high for shrink-swell, differential settlement, and liquefaction potential.

[5] United States Geological Survey (USGS), 1983. Geologic Map of San Mateo County, USGS Misc. Investigation I-1257-A.

[6] United States Geological Survey (USGS), 1979. Flatlands Deposits of the San Francisco Bay Region, California, USGS Professional Paper 943. Jointly by DOI, HUD, USGS.

[7] Robert H. Born Consulting Engineers, Inc. (RHB), 1988. "Report on Analysis of Foster City Levees," June 15.

[8] ENGEO, 2009. Geotechnical Report Foster City Levees Pedway Improvements. August 20.

isolated layers. Notably, significant amounts of coarse debris (sometimes present in bay fill materials) were not generally encountered in the project-specific subsurface investigation. Groundwater was measured at depths of 7–10 feet below ground surface at the time the borings were drilled (i.e., generally below the bottom of the unsaturated fill). Asphalt pavement (2–8 inches thick) is present along the crest of most of the existing levee alignment. Rip-rap has been placed[9] and maintained on the bayside slope of the levees in most areas to provide erosion protection.

The fill material is underlain by a layer of weak, compressible, olive green, very soft to firm young Bay Mud, which extends to depths of approximately 20–40 feet below ground surface. With depth, the composition of the sediments transition (or grade) into gray to blue-gray, firm to stiff silty clay (characteristic of older Bay Mud deposits). Intermittent medium dense to dense silty sand to clayey sand/sand lenses were encountered within the Bay Mud deposits. Thin layers of peat (highly organic sediments) were noted in these deposits at some of the boring locations. These sediments extend at least to the depth explored by the site-specific geotechnical investigations (102.5 feet below existing ground surface).

(3) Soils

For purposes of this study, “soils” refers to the uppermost subsurface materials that are exposed to soil-forming processes, including the most intense physical and chemical weathering, interaction with vegetation, and erosion by and infiltration of surface water. The project site and surrounding areas were originally part of tidal marshlands. By 1897, several thousand acres of the tidal marshlands were diked and drained to form an area known as Brewer’s Island.[10] Brewer’s Island was the precursor of Foster City. As part of the preparation for the development of Foster City as a planned community in the late 1950s, approximately 14 million cubic yards of sandy silt was pumped in from San Bruno Shoal to provide 4–5 feet of fill throughout the area of Foster City. Subsequent to the original construction of the levees, additional fill has been placed to raise the elevation of their crests.

Regional soil mapping indicates that the project site is located within an area classified as Urban land-Orthents, reclaimed complex, 0–2 percent slopes.[11] This soil unit consists of

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[9] Rip rap consists of coarse rock fragments (up to boulder size) generally placed in gradation (coarsening outward/upward) and on a synthetic fabric (geotextile) to reduce the potential for internal erosion.

[10] City of Foster City, 2014. The Creation of Foster City. http://www.fostercity.org/ourcommunity/Creation-of-Foster-City-Part-1.cfm, accessed June 7, 2016.

[11] Natural Resources Conservation Service, 2014. Web Soil Survey, USDA Mapping. http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

about 65 percent urban land, 30 percent Orthents, reclaimed, and 5 percent minor soil components and water bodies.[12] Areas designated as "urban land" have essentially no soil and are covered by streets, parking lots, buildings, and other structures, while Orthents, reclaimed are soils that show no soil horizon development and consist of fill material and Bay Mud.[13]

b. Seismic Conditions

The entire San Francisco Bay Area is located within the San Andreas Fault Zone, a complex of active faults (i.e., faults that have evidence of rupture in the past 11,000 years) forming the boundary between the North American Plate and Pacific Plate. Movement of the plates relative to one another result in the accumulation of strain along the faults, which is released during earthquakes. Numerous historic earthquakes have been generated in northern California by the San Andreas Fault Zone. This level of active seismicity results in relatively high seismic risk in the San Francisco Bay Area. Regional active faults in the San Francisco Bay Area are shown on Figure V.E-1.[14]

The latest USGS Working Group on California Earthquake Probabilities estimates a 72 percent chance of at least one magnitude (M_{w}, or Moment Magnitude)[15] 6.7 or greater earthquake over the next 30 years, including a 6.4 percent chance on the San Andreas Fault, a 7.4 percent chance on the Calaveras Fault, and a 14.3 percent chance on the Hayward-Rogers Creek Fault.[16]

c. Seismic, Soils, and Geologic Hazards

Seismic, soils, and geologic hazards include surface rupture, ground shaking, liquefaction, lateral spreading, landslides, settlement and differential settlement, and expansive and corrosive soils. Each of these hazards is discussed below.

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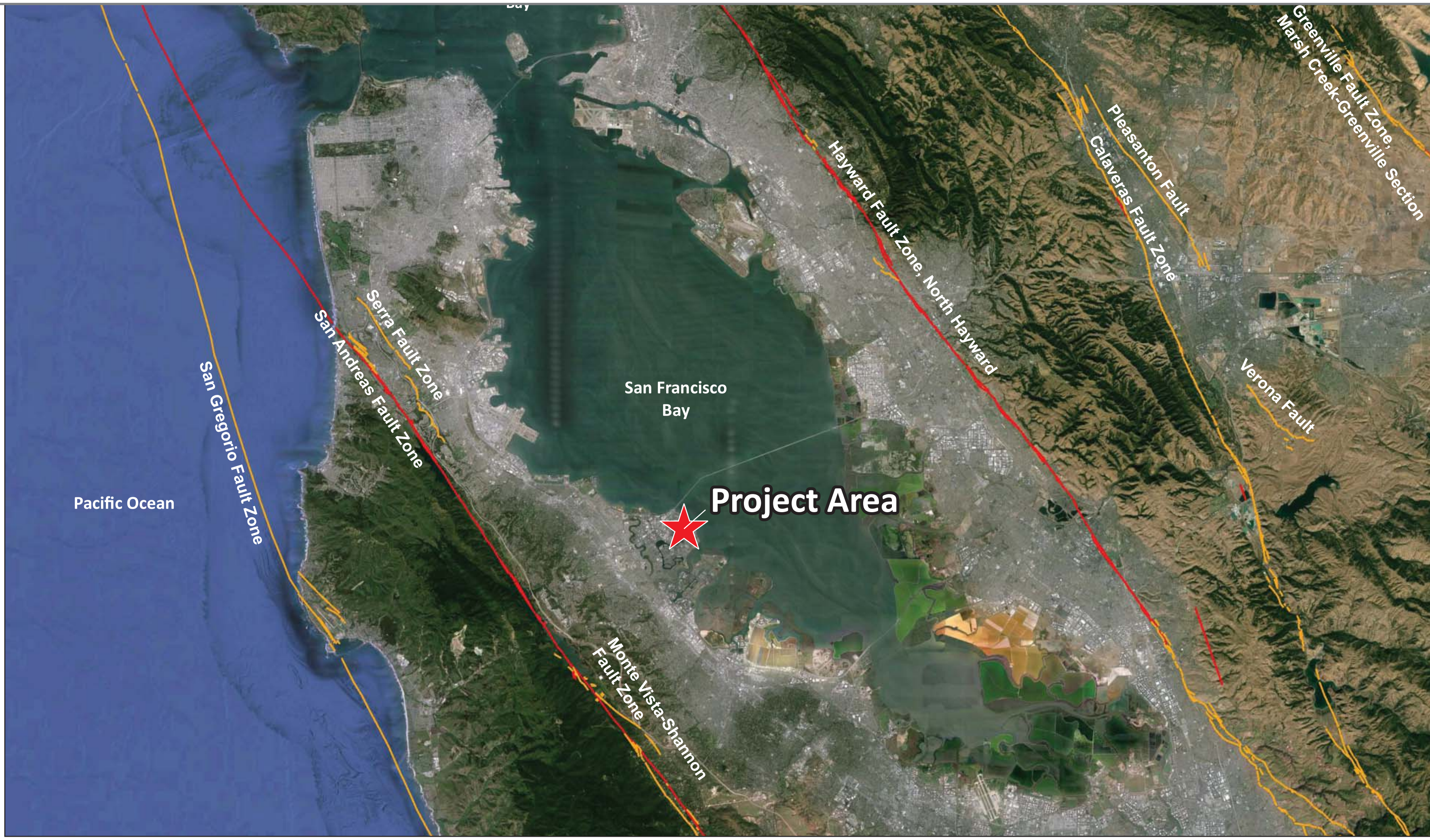
[12] Natural Resources Conservation Service, 2014, op. cit.

[13] Soil Conservation Service, 1991. Soil Survey of San Mateo County, Eastern Part, and San Francisco County, California.

[14] California Geological Survey (CGS), 2010. 2010 Fault Activity Map of California, Geologic Data Map No. 6. http://www.quake.ca.gov/gmaps/FAM/faultactivitymap.html, accessed December 8, 2014.

[15] Moment magnitude (M_w) is now commonly used to characterize seismic events as opposed to Richter Magnitude. Moment magnitude is determined from the physical size (area) of the rupture of the fault plane, the amount of horizontal and/or vertical displacement along the fault plane, and the resistance to rupture of the rock type along the fault.

[16] United States Geological Survey (USGS), 2015, UCERF3: A New Earthquake Forecast for California's Complex Fault System, USGS Fact Sheet 2015-3009, March.



Legend

- Historic (movement in last 150 years)
- Holocene-Latest to Pleistocene (less than 15,000 years old)

Source: USGS, 2016, Quaternary Faults in Google Earth, Website: http://earthquake.usgs.gov/hazards/afaults/google.php.

0 30 Miles

06.21.2016 P:\15-016 FCLV\PRODUCTS\Graphics\InDesign Files

Source: BASELINE Environmental Consulting, 2016

Figure V.E-1
Foster City Levee Protection Planning and Improvements Project EIR
Regional Faults

(1) Surface Rupture

Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. Surface rupture generally can be assumed to occur along an active or potentially active major fault trace. The project site is not located within an area mapped as subject to surface rupture under the Alquist-Priolo Earthquake Fault Zoning Act, and no known active or potentially active faults cross the site.[17, 18, 19] The nearest Alquist-Priolo Earthquake Fault Zone is the San Andreas Fault, located about 6 miles southwest of the project site (Figure V.E-1).[20]

(2) Ground Shaking

Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. The Modified Mercalli Intensity Scale (MMI) is the most commonly used scale for measurement of the subjective effects of earthquake intensity (Table V.E-1). As described above, the closest active fault to the proposed project is the San Andreas Fault, located approximately 6 miles to the southwest. The San Andreas Fault is considered capable of generating a Mw 7.9 earthquake (similar to the 1906 San Francisco quake).[21] An earthquake of this magnitude on the San Andreas Fault would generate violent (MMI IX) ground shaking at the proposed project site.[22] The project site also has the potential to be subject to strong (MMI VII) to very strong (MMI VIII) ground shaking generated by an earthquake on the Calaveras Fault, Concord-Green Valley Fault, Greenville Fault, Hayward Fault, Mount Diablo Thrust Fault, or San Gregorio Fault.[23]

(1) Liquefaction and Lateral Spreading

Liquefaction is the temporary transformation of loose, saturated granular sediments from a solid state to a liquefied state as a result of seismic ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or

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[17] California Department of Conservation (CDC), 1974. State of California Special Studies Zones, San Mateo Quadrangle Map [Alquist-Priolo Map]. http://www.quake.ca.gov/gmaps/WH/regulatorymaps.htm.

[18] California Geological Survey (CGS), 2010, op. cit.

[19] City of Foster City, 1995. *General Plan, Chapter 7, Safety Element*. Adopted October.

[20] California Department of Conservation (CDC), 1974, op. cit.

[21] Association of Bay Area Governments (ABAG), 2008. Shaking Scenarios. http://resilience.abag.ca.gov/earthquakes/sanmateo/, accessed December 8, 2014.

[22] Ibid.

[23] Ibid.

TABLE V.E-1 MODIFIED MERCALLI SCALE

I	Not felt except by a very few under especially favorable circumstances.
II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
VII	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Board fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

Source: California Geological Survey (CGS), 2002. *How Earthquakes and Their Effects are Measured*: Note 32.

ground failure. Because saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface (generally less than 50 feet below ground surface) have higher liquefaction potential than those in which the water table is at greater depths. Granular sediments that include a significant amount (generally greater than 15 percent) of fine sediment are less susceptible to liquefaction than "cleaner" sediments. Granular sediments with relatively high density (i.e., more compacted) are less susceptible than looser sediments.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other "free" face, such as an excavation boundary. In a lateral spread failure, a layer of ground at the surface is carried on an underlying layer of liquefied material over a nearly flat surface toward a river channel or other bank.[24] Therefore, the lateral spreading hazard will tend to be controlled by and similar to the liquefaction hazard (i.e., low) for a site.

USGS studies of the San Francisco Bay Area provide information on regional Quaternary deposits and liquefaction susceptibility.[25] Based on these regional studies, the Association of Bay Area Governments (ABAG) mapping indicates that the site's liquefaction hazard (susceptibility combined with likelihood) is moderate to very high.[26] Regional studies can help provide guidance for general planning and hazard potential assessment; however, site-specific studies are needed to assess the design and engineering requirements for any particular site. The site-specific geotechnical investigation found that the project site is primarily underlain by soft to stiff clays with some medium dense to dense sandy soils. Based on the cohesion and density of these subsurface deposits, the project-specific geotechnical investigations conclude that the potential for liquefaction and lateral spreading is low at the project site.[27,28]

(2) Landslides (Slope Failure)

Slope failure can occur as either rapid movement of large masses of soil (landslide) or slow, continuous movement (creep). The project site comprises the alignment of an existing levee system at the margin of San Francisco Bay. The existing levees are relatively low, with elevations generally less than 15 feet above adjacent ground on the landward side and less than 20 feet above the bay. The sideslopes of the existing levees are moderately steep to steep (4:1 to 2:1). The stability of the existing slopes has been evaluated in geotechnical evaluations performed for the proposed project.[29,30] These evaluations included a technical inspection of the condition of the levees and a slope stability analysis.

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[24] Association of Bay Area Governments (ABAG), 2001.The REAL Dirt on Liquefaction, A Guide to the Liquefaction Hazard in Future Earthquakes Affecting the San Francisco Bay Area, February.

[25] USGS, 2006. Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region. http://pubs.usgs.gov/of/2006/1037/.

[26] Association of Bay Area Governments (ABAG), 2006. Liquefaction Susceptibility. http://resilience.abag.ca.gov/earthquakes/, accessed on December 8, 2014.

[27] Robert H. Born Consulting Engineers, Inc. (RHB), 1988, op. cit.

[28] ENGEO, 2009, op. cit.

[29] Robert H. Born Consulting Engineers, Inc. (RHB), 1988, op. cit.

According to the reported observation of the condition of the existing levees, the earthen embankments are generally stable.[31,32] One investigation described a former slope failure on the bayside of the existing levee in 1984 (in the area of Lantern Cove) during construction of levee improvements. This failure included longitudinal cracking near the crest and slumping of the bayside slope, and may have been related to loading associated with use of the crest as a haul road during construction activities.[33] Some significant areas of longitudinal cracking, potentially associated with settlement and/or lateral movement of the levee fill, was observed along some portions of the existing alignment.[34]

The condition of the levees at the project site is inspected periodically (generally, quarterly) by the City of Foster City. The most recent inspection report[35] did not identify any significant active slope failures on either the land or bayside slopes of the levees. Observed areas of minor "superficial sliding" do not affect the integrity of the levees. However, there is evidence of longitudinal cracking (a possible indication of slope movement), which may require additional monitoring or repair. Evidence of major (i.e., large or deep) depressions (a possible indication of void formation and collapse in levee sediments) on the crest was not observed. In limited areas, the geotextile underlying the riprap on the bayside of the levee was exposed, indicating minor erosion and slumping of the riprap (particularly finer sediment sizes). Those identified areas have been repaired.

The results of the slope stability analysis indicate that the existing slopes are stable under static and expected earthquake shaking (pseudostatic) conditions. Slope stability is generally defined in terms of factor of safety (FS), the ratio of forces resisting slope failure to the forces driving failure. If the driving forces exceed the resisting forces, the FS is less than 1.0 and the analyzed slope is prone to failure. The U.S. Army Corps of Engineers (USACE) guidance for slope stability for earthen embankments set a minimum long-term FS at 1.5.[36] The estimated FS under static conditions for a typical cross-section of the existing levees at the project site were between 1.9 (bayside slope) and 2.5 (land side slope). Under

[30] ENGEO, 2009, op. cit.

[31] Robert H. Born Consulting Engineers, Inc. (RHB), 1988, op. cit.

[32] ENGEO, 2009, op. cit.

[33] Robert H. Born Consulting Engineers, Inc. (RHB), 1988, op. cit.

[34] ENGEO, 2009, op. cit.

[35] City of Foster City, 2016f. Quarterly Report for Inspection, Maintenance, and Operation of the City of Foster City Levee System. June.

[36] U.S. Army Corps of Engineers (USACE), 2000. Design and Construction of Levees. Engineer Manual No. 1110-2-1913.

seismic shaking assumptions (pseudostatic conditions), guidance for minimum FS for permanent embankments slopes is 1.1.[37]

(3) Settlement and Differential Settlement

Settlement[38] is the lowering of the land-surface elevation as a result of the compression, compaction, or consolidation of underlying soils, sediment, or rock. These processes can occur under increased loading (e.g., construction of structures including fills) or the withdrawal of subsurface water. The processes cause a reduction in the volume of the materials. Compaction and compression generally occur within unconsolidated granular soils or sediment over a relatively short time frame. Consolidation usually occurs over longer period (sometimes many years) in saturated finer grained material as pore water (i.e., water within the spaces between sediment grains) is forced out of the sediment structure under loading. The young Bay Muds that underlie the project site are well known to be susceptible to consolidation, and resulting settlement has occurred at many development sites on the margin of San Francisco Bay.

Settlement or differential (e.g., unequal) settlement could occur if structures or other improvements are built on low-strength foundation materials (including imported non-engineered fill) or if improvements straddle the boundary between different types of subsurface materials (e.g., Bay Mud and imported fill, buried sloughs or levees, older un-engineered fill and/or new engineered fill). The amount and rate of consolidation of sediment and resulting settlement are primarily controlled by the magnitude of the load imposed on the sediment, the time period over which loads are applied, and the thickness of the sediments susceptible to consolidation. Although settlement generally occurs slowly enough that its effects are not sudden or catastrophic, it can cause significant damage to structures over time.

The project-specific geotechnical evaluations have addressed the expected occurrence of settlement at the project site. These evaluations recognized the potential for ongoing settlements related to consolidation of Bay Muds under the loading imposed by existing fills as well as those resulting from the construction of new fills.

(4) Expansive and Corrosive Soils

Expansion and contraction of soil volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the

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[37] California Department of Transportation (Caltrans), 2014. Caltrans Geotechnical Manual.

[38] Land surface settlement can be referred to a "land subsidence," a term generally used for settlement of large magnitude or affecting a large area.

volume of the soil changes markedly. As a consequence of such volume changes, structural damage to buildings and infrastructure may occur if potentially expansive soils are not considered in project design and during construction. Specific analyses of the expansion potential of the sediments and soil at the project site have not been performed. However, a recent geotechnical investigation[39] performed for a site adjacent to the northern area of the project site (and underlain by fill materials similar to those found at the project site) notes that surface materials at the site consist of up to 11 feet of man-made fill and that the fill is not expansive. Based on this result (and the characteristics of sediments encountered at the site), the performance of existing levees and pavements at the project site are not expected to be adversely affected by expansive soils.

Corrosivity is a function of the chemical composition of the soils and the materials from which it is derived. If not addressed by design measures and proper selection of building materials, corrosive soils could cause substantial damage to building foundations, pavements, utilities, and/or other improvements. As part of the geotechnical investigation conducted adjacent to the project site,[40] the corrosivity of one sample of fill and one sample of Bay Mud was analyzed. The laboratory analysis of the samples found that the fill is corrosive and that the Bay Mud is severely corrosive.

(5) Mineral Resources

Mineral resources include metals, valuable mineral, and construction materials such as sand and gravel and rip rap. The setting of the site does not include natural valuable mineral resources. The project site is located within an area classified by the CGS as Mineral Resource Zone MRZ-1, "Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence."[41]

e. Regulatory Framework

The state and local regulations related to soils, geology, and seismicity that are relevant to the proposed project are described below.

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[39] Langan Treadwell Rollo, 2014. Draft Geotechnical Investigation, Lincoln Centre Campus, Foster City, California. No. 731622001. December 19.

[40] Langan Treadwell Rollo, 2014, op. cit.

[41] California Department of Mines and Geology (CDMG), 1987 updated 1996. Mineral Land Classification: Aggregate Minerals in the San Francisco-Monterey Bay Area, California Department of Conservation.

(1) California Building Code

The 2013 California Building Code (CBC), which refers to Part 2 of the California Building Standards Code in Title 24 of the California Code of Regulations, is based on the 2012 International Building Code, and is the most current state building code. The 2013 CBC governs the design and construction of both buildings for human occupancy and non-building structures. Chapter 18 of the CBC covers design issues related to soils and foundations, and grading and other soil management issues are addressed in Appendix J. Foster City follows the most current state building codes.[42] The City of Foster City Building Department is responsible for reviewing plans, issuing building permits, and conducting field inspections.

The 2013 CBC requires that a site-specific geotechnical investigation report be prepared by a licensed professional for certain proposed developments that require foundations or that result in the development of slopes. The purpose of a site-specific geotechnical investigation is to identify seismic and geologic conditions requiring project mitigation, such as ground shaking, liquefaction, or soil stability. Requirements for the geotechnical investigation are presented in Chapter 16 “Structural Design” and Chapter 18 “Soils and Foundation” of the 2013 CBC. The Building Department is required to review geotechnical investigations prior to issuing building permits.

(2) Alquist-Priolo Earthquake Fault Zoning Act

Surface rupture is the most easily avoided seismic hazard. The Alquist-Priolo Earthquake Fault Zoning Act was passed in December 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act’s main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. As discussed in Section E.1.c (*Seismic and Geologic Hazards*) above, the project site is not located within an Alquist-Priolo Earthquake Fault Zone.

(3) Seismic Hazards Mapping Act

In 1990, following the Loma Prieta earthquake, the California Legislature enacted the Seismic Hazards Mapping Act (SHMA) to protect the public from the effects of strong ground shaking, liquefaction, landslides, and other seismic hazards. The SHMA established a statewide mapping program to identify areas subject to violent shaking and ground failure; the program is intended to assist cities and counties in protecting public health and safety. The SHMA requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate

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[42] City of Foster City Municipal Code, Chapter 1.01 Code Adoption and Chapter 15.04 Building Code.

certain development projects within these zones. As a result, the CGS is mapping SHMA zones and has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, ground shaking, and landslides (primarily the San Francisco Bay Area and Los Angeles basin). Before a development permit is granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures must be incorporated into the project design. At the time of the preparation of this EIR, the area of the project has not yet been mapped by the CGS in conformance with the SHMA, although mapping is reportedly in progress.[43]

(4) Surface Mining and Reclamation Act of 1975

The principal legislation addressing mineral resources in California is the State Surface Mining and Reclamation Act of 1975 (SMARA) (Public Resources Code Sections 2710–2719), which was enacted in response to land use conflicts between urban growth and essential mineral production. SMARA specifies that lead agencies require financial assurances of each mining operation to ensure reclamation is performed in accordance with the approved reclamation plan. The financial assurances may take the form of surety bonds, irrevocable letters of credit, trust funds, or similar mechanisms.

(5) City of Foster City

The Foster City Municipal Code and the Estero Municipal Improvement District (EMID) Code are a compilation of Foster City's and EMID's applicable ordinances (rules, regulations, or standards). They are the City and EMID's primary codes. Secondary codes include any other codes adopted by reference (e.g., the 2013 CBC). Applicable geologic and seismic safety regulations in the City's General Plan and in the Municipal Code are described below.

Foster City General Plan

The following goals, policies, and programs from the Foster City General Plan Safety Element related to seismic and geologic hazards pertain to the proposed project:

> *Safety Goal S-A Protect From Seismic and Geologic Hazards.* Protect the community from unreasonable risk to life and property caused by seismic and geologic hazards.

Policy S-1 Use Most Current Uniform Codes. The City will use the most current uniform codes to review permits for new and modified structures.

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[43] California Geological Survey (CGS), 2014. Seismic Hazards Zonation Program. http://www.conservation.ca.gov/cgs/shzp/Pages/Index.aspx, accessed June 13, 2016.

Program S-a Geotechnical and Engineering Reports. The City (Building Inspection Division) will require site specific geotechnical and engineering reports for new structures.

Municipal Code Ordinances: Title 15 - Buildings and Construction

> *Chapter 15.04: Building Code.* Title 15 of the Foster City Municipal Code includes amendments to the 2013 California Building Code that may affect the proposed project. These changes are detailed under individual chapters beginning with 15.04.010 of the Foster City Municipal Code.[44]

2. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to soils, geology, and seismicity that could result from implementation of the proposed project. Included are (1) the criteria of significance (consistent with Appendix G of the CEQA Guidelines), which establish the thresholds for determining whether an impact is significant; and (2) the soils, geology, and seismicity impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

The project would have a significant soils, geology, or seismicity impact if it would:

- Expose people or structures to substantial risk of loss, injury, or death involving:
- Rupture of a known active or potentially active 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;
- Strong seismic ground shaking;
- Seismic-related ground failure, including liquefaction; or
- Landslides.
- Result in substantial soil erosion or loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in an on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Be located on expansive soils (as defined in Table 18-1-B of the 1994 Uniform Building Code) or corrosive soils, which could cause substantial risks to life or property,

[44] City of Foster City Municipal Code, Chapter 15.04 Building Code.

including damage to building foundations, pavements, utilities, and/or other improvements.

- 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.
- 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.

These criteria are adapted from the *CEQA Guidelines* Environmental Checklist. A criterion regarding septic tanks and alternative wastewater disposal systems is not included because the project would not include construction of septic tanks and alternative wastewater disposal systems (and the area is served by a municipal wastewater system).

b. Less-Than-Significant Soils, Geology, and Seismicity Impacts

Implementation of the proposed project would result in the less-than-significant impacts described below. Because these impacts would not exceed the significance criteria described above, they do not require mitigation measures.

(1) Surface Rupture

The most recent Alquist-Priolo Earthquake Fault Zoning maps indicate that the nearest active fault to the project site is the San Andreas Fault, approximately 6 miles to the southwest. Additionally, no known active or potentially active faults cross the site.[45, 46, 47] The proposed project would therefore not be expected to be affected by rupture of a known active fault.

(2) Liquefaction and Lateral Spreading

The project-specific geotechnical investigation found that subsurface materials at the site consist of medium dense to dense sandy soils and soft to hard clays, and consequently have a relatively low risk of liquefaction and lateral spreading. Therefore, the potential of liquefaction and lateral spreading to result in substantial risk to people and structures on the project site is less than significant.

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[45] California Department of Conservation (CDC), 1974, op. cit.

[46] California Geological Survey (CGS), 2010, op. cit.

[47] City of Foster City, 1995, op. cit.

(3) Landslides (Slope Failure)

Potential impacts from the loss of topsoil and soil erosion are discussed in *Section V.F, Hydrology and Water Quality*, of this EIR. Implementation of the proposed project would not be affected by slope instability because the project site and surrounding areas are gently sloped. Therefore, the risk of landslides at the project area is considered to be less than significant.

(4) Mineral Resources

The project site is located within an area classified as MRZ-1, "Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence."[48] Additionally, the project site is not identified in a planning document as being a locally important mineral resource site. The project would therefore not result in the loss of, or hinder the availability of, a known mineral resource of value locally or to the region or state.

c. Significant Soils, Geology, and Seismicity Impacts

The development of the proposed project could result in significant impacts related to seismic shaking hazards, settlement and differential settlement, and soil corrosion, as discussed below.

(1) Settlement and Differential Settlement – Project Construction

The project would include the creation of temporary slopes during construction of the proposed levee improvements and the excavation of footings for conventional flood walls. Additionally, temporary stockpiling of fill material would occur at the staging areas.

<u>Impact GEO-1</u>: Damage to Levee project structures or property could result from unstable soil conditions during the construction period. (S)

Improper management of temporary slopes could result in slope failures that could cause damage to structures and/or risk to human safety. Existing utilities and/or pavements in stockpile areas (such as along Beach Park Boulevard) could be damaged by the loading (and possible settlement) associated with fill material stockpiles. Implementation of the following mitigation measure would reduce the risk of damage related to settlement during construction to a less-than-significant level:

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[48] California Department of Mines and Geology (CDMG), 1987 updated 1996, op. cit.

Mitigation Measure GEO-1: Implement Mitigation Measures GEO-2a through GEO-2c. (LTS)

(2) Expansive and Corrosive Soils – Project Operation

The project-specific geotechnical investigations found that the man-made fill of which the existing levees are constructed is underlain by highly compressible young Bay Mud. Compression and/or consolidation of the sediments could result in settlement that reduces intended flood protection or levee slope stability. Available information indicates that the site fill is corrosive and that the Bay Mud is extremely corrosive. The corrosivity of the soils could cause or accelerate the deterioration or corrosion of concrete or steel placed in contact with them.

Impact GEO-2: Damage to Levee project structures or property could result from unstable or corrosive soils during the operation period. (S)

The FS[49] of an embankment (such as proposed site levees) slopes generally decreases as the embankment is raised. The slopes become higher and the load on the underlying materials increases. The end of construction when the fill and foundation materials are undrained (i.e., pore water sediments have not drained) usually represents the critical short-term loading condition for embankments. The FS generally increases with time following construction because of the consolidation of foundation soils and the dissipation of pore pressures in the embankment fill and foundation materials.[50]

The introduction of new loads, such as additional fill and/flood wall, would therefore be expected to result in potentially significant total and differential settlement. In the case of the proposed project, settlement could result in gradual lowering of the proposed levees and/or flood walls and reduction in the intended level of flood protection. Although the evaluations of settlement are preliminary (i.e., will require refinement on the basis of final design), the expected settlement is estimated to be in the range of 0.25–0.42 feet per 1-foot increase in thickness of fill on existing levees. For fill placed outside the existing levees, the estimated range of settlement is 0.50–0.75 feet per foot of new fill. In areas underlain by the thickest deposits of young Bay Mud, the amount of settlement could be significantly (possibly two times) higher.

The project proposes increasing the elevation of the flood control structures (i.e., levees, flood walls, and/or sheet pile walls) to provide flood protection that would, at a minimum,

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[49] The factor of safety, or FS, is the ratio of forces resisting slope failure to the forces driving failure.

[50] U.S. Army Corps of Engineers (USACE), 2003. Slope Stability Engineering and Design. Engineer Manual No. EM 1110-2-1907.

meet Federal Emergency Management Agency (FEMA) requirements for freeboard above the design flood elevation. The height of the structures would exceed these requirements under the 2050 Sea Level Rise scenario by about 1–2.5 feet and under the 2100 Sea Level Rise scenario by 3.5–5.5 feet.

These designs could be lowered to meet only the minimum FEMA levee elevation, but the goal of meeting protection against future sea level rise would be compromised. The potential for settlement would increase with the magnitude of loading. Therefore, the potential would be highest for improvement alternatives that include the most additional fill placement. Conventional flood wall construction would be expected to result in reduced loading, relative to the earthen fill levee improvement option, and loading related to sheet pile floodwall would be negligible (though the fill placement associated with the sheet pile flood wall would still be subject to settlement).

The project proposes to meet FEMA requirements to maintain accreditation of the proposed flood control structures. The monitoring and maintenance requirements include conducting regular surveying (every two years) of the elevation of the top of the structures and correction of any observed deficiencies. The requirements will allow the detection and remediation of any significant reduction of levee elevation related to long-term settlement. Additionally, the monitoring of slope stability is required to detect and repair any slope instability problems that may develop.

Mitigation Measure GEO-2: Implementation of the following three-part mitigation measure would reduce impacts to Levee project structures or property related to unstable and corrosive soils to a less-than-significant level:

GEO-2a: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement the following requirements. This mitigation measure requires that prior to the issuance of any grading or construction permits, a final geotechnical investigation report shall be prepared by a qualified Geotechnical Engineer or Certified Engineering Geologist and submitted to the City Building Inspection Division for review and approval. In addition to all other requirements, the final geotechnical investigation report shall specifically provide recommendations to minimize:

- The potential for adverse effects to existing utilities, pavements, or other structures caused by loading associated with temporary stockpiles.
- The potential damage to structures from total and differential settlement, including damage to or reduction in the flood protection provided by levees, conventional flood walls, and sheet pile walls.
- The potential for damage to flood control structures or pavements caused by expected seismic shaking.

- The potential for damage caused by soil expansion or corrosion to steel and concrete or any other material that may be placed in the subsurface. The recommendations shall incorporate the information obtained from the final soil analysis.

All design measures, recommendations, design criteria, and specifications set forth in the final geotechnical investigation report shall be implemented as a condition of project approval.

GEO-2b: A licensed Geotechnical Engineer, or their representative, shall be retained to review the geotechnical aspects of the design and engineering plans. The Geotechnical Engineer shall be allowed sufficient time to provide the project design team with comments prior to the issuance of the final plans. These comments shall be considered by the Geotechnical Engineer or Certified Engineering Geologist preparing the plans. Where consensus is reached between the two parties, the plans will be modified accordingly. If consensus is not reached, another third-party Geotechnical Engineer shall be retained to make the determination.

GEO-2c: A licensed Geotechnical Engineer, or their representative, shall be retained to provide geotechnical observation and testing during all earthwork and foundation construction activities. The Geotechnical Engineer shall be allowed to evaluate any conditions differing from those encountered during the geotechnical investigation and shall provide supplemental recommendations, as necessary which the City of Foster City Public Works Department and/or the project team shall require the project contractor to implement. At the end of construction, the Geotechnical Engineer shall provide a letter regarding contractor compliance with project plans and specifications and with the recommendations of the final geotechnical investigation report and any supplemental recommendations issued during construction. The letter shall be submitted for review to the City Building Inspection Division.

Implementation of the above three-part mitigation would reduce this impact to a less-than-significant level. (LTS)

(3) Ground Shaking – Project Operation

All structures in the San Francisco Bay Area could be affected by ground shaking in the event of an earthquake on regional active faults. The amount of ground shaking would depend on the magnitude of the earthquake, the distance from the epicenter, and the type of earth materials between the receptor and the epicenter. Strong to violent ground shaking is expected at the proposed project during predicted earthquakes on the San Andreas and other regional active faults.

Impact GEO-3: Levee project structures would be subject to seismic shaking hazards during the operation period. (S)

Although strong ground shaking could occur during the construction period, the risk is reduced by virtue of the relatively short time frame of construction. The level of expected seismic shaking during operation could cause considerable damage to proposed flood control structures. Even properly constructed earthen embankments could experience damage (e.g., localized slope failures) that could require repairs. Seismic damage to flood walls (both sheet pile walls and concrete walls) built to seismic design standards would be expected to be low. Implementation of the following mitigation measure would reduce the risk to flood control structures from seismic shaking to a less-than-significant level:

> Mitigation Measure GEO-3: Implement Mitigation Measures GEO-2a through GEO-2c. (LTS)

d. Cumulative Impacts

For geology and soils, the cumulative impact area considered is the City of Foster City. Impacts related to geologic hazards are generally site specific rather than cumulative in nature, because each project area has unique geologic considerations that would be subject to uniform site development and construction standards. Therefore, the potential for cumulative impacts is limited to the project site and adjacent sites. Impacts associated with potential geologic hazards related to soil or other conditions occur at individual building sites. These effects are site-specific and impacts would not be compounded by additional development. Therefore, no significant cumulative impact relating to geology and soils is occurring, or would be expected to occur, in the vicinity.

F. GREENHOUSE GAS EMISSIONS

This section provides a summary of the existing environmental conditions and regulatory setting for greenhouse gas (GHG) emissions, and analyzes potential impacts from GHG emissions that would result during construction of the proposed project. This analysis was conducted following guidance provided by Bay Area Air Quality Management District (BAAQMD). The impact analysis evaluates the potential for both project-level and cumulative environmental impacts.

1. Environmental Setting

a. Climate Change and Greenhouse Gas Emissions

Existing GHGs allow about two-thirds of the visible and ultraviolet light from the sun to pass through the atmosphere and be absorbed by the Earth's surface. To balance the absorbed incoming energy, the surface radiates thermal energy back to space at longer wavelengths primarily in the infrared part of the spectrum. Much of the thermal radiation emitted from the surface is absorbed by the GHGs in the atmosphere and is re-radiated in all directions. Since part of the re-radiation is back towards the surface and the lower atmosphere, the global surface temperatures are elevated above what they would be in the absence of GHGs. This process of trapping heat in the lower atmosphere is known as the greenhouse effect.

An increase of GHGs in the atmosphere results in a global warming trend. Increases in global average temperatures have been observed since the mid-20th century, and have been linked to observed increases in GHG emissions from anthropogenic sources. The primary GHG emissions of concern are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Other GHGs of concern include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6), but their contribution to climate change is less than 1 percent of the total by well-mixed[1] GHGs.[2] Each GHG has a different global warming potential (GWP). For instance, CH_4 traps about 21 times more heat per molecule than CO_2. As a result, emissions of GHGs are reported in metric tons of "carbon dioxide equivalents" (CO_2e), where each GHG is weighted by its GWP relative to CO_2.

According to the Intergovernmental Panel on Climate Change (IPCC), the atmospheric concentrations of CO_2, CH_4, and N_20 have increased to levels unprecedented in at least the last 800,000 years due to anthropogenic sources. In 2010, the concentrations of CO_2, CH_4,

[1] GHGs that have atmospheric lifetimes long enough to be relatively homogeneously mixed in the troposphere.

[2] Intergovernmental Panel on Climate Change (IPCC), 2013. *Climate Change 2013; the Physical Science Basis; Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.*

and N_20 exceeded the pre-industrial era (before 1750) by about 39, 158, and 18 percent, respectively.[3] The Earth's mean surface temperature in the Northern Hemisphere from 1983–2012 was likely the warmest 30-year period over the last 1,400 years.[4]

The global increases in CO_2 concentration are due primarily to fossil fuel combustion, cement production, and land use change (e.g., deforestation). The dominant anthropogenic sources of CH_4 are from ruminant livestock, fossil fuel extraction and use, rice paddy agriculture, and landfills, while the dominant anthropogenic sources of N_20 are from ammonia for fertilizer and industry.[5] All emissions of HFCs, PFCs, and SF6 are not naturally-occurring and originate from industrial processes such as semiconductor manufacturing, use as refrigerants and other products, and electric power transmission and distribution.[6]

b. Existing Greenhouse Gas Emissions and Projections

In 2011, the California Air Resources Board (CARB) estimated that transportation was the source of about 37 percent of California's GHG emissions, followed by industrial sources and electrical power generation at about 20 percent each.[7] In 2011, 86.6 million metric tons of CO_2e were emitted from anthropogenic sources within the San Francisco Bay Area Air Basin (SFBAAB). The CO_2 emissions dominate the GHG inventory in the SFBAAB, accounting for about 90 percent of the total CO_2e emissions reported.[8] The 2011 GHG emissions in the SFBAAB are summarized in Table V.F-1.

c. Effects of Greenhouse Gas Emissions

According to the BAAQMD's *Bay Area 2010 Clean Air Plan* (CAP), some of the potential effects of increased GHG emissions and associated climate change may include loss in snow pack (affecting water supply), more frequent extreme weather events, more large forest fires, more drought years, and sea level rise (the latter of which is particularly relevant to the project site). In addition, climate change may increase electricity demand for cooling, decrease the availability of hydroelectric power, and affect regional air quality and public health.[9]

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[3] Bay Area Air Quality Management District (BAAQMD), 2015. *Bay Area Emissions Inventory Summary Report: Greenhouse Gases, Base Year 2011*. January.

[4] Intergovernmental Panel on Climate Change (IPCC), 2013, op. cit.

[5] Ibid.

[6] Bay Area Air Quality Management District (BAAQMD), 2015, op. cit.

[7] California Air Resource Board (CARB), 2015. *California Greenhouse Gas Emissions for 2000 to 2013 – Trends of Emissions and Other Indicators*. June 16.

[8] Bay Area Air Quality Management District (BAAQMD), 2010. *Bay Area 2010 Clean Air Plan*. September 15.

[9] Ibid.

TABLE V.F-1 SAN FRANCISCO BAY AREA 2011 GHG EMISSIONS INVENTORY

Pollutant	Percent	CO_2e (Million Metric Ton/Year)
CO_2	90.3	78.2
CH_4	3.0	2.6
N_20	1.7	1.5
HFC, PFC, SF_6	4.9	4.3
Total	100	86.6

Source: BAAQMD, 2015, op. cit.

In the absence of policy changes (also referred to as a "business as usual" scenario), the BAAQMD estimated that the 2011 SFBAAB GHG emissions would increase at an average rate of approximately 0.5 percent per year based on projected population growth and economic expansion (Table V.F-2).[10]

TABLE V.F-2 SAN FRANCISCO BAY AREA GHG EMISSIONS TRENDS (MILLION METRIC TONS CO_2E)

Category	2011	2014	2017	2020	2023	2026	2029
Transportation	34.3	33.9	32.5	30.4	30.8	30.8	31.2
Indus./Comm.	31	32.6	34.3	36	37.6	39.3	40.8
Electricity/Co-Gen.	12.1	12.9	12.6	12.3	12.4	12.5	12.7
Residential Fuel	6.6	6.7	6.8	6.9	7	7.1	7.2
Off-Road Equip.	1.3	1.3	1.4	1.3	1.4	1.5	1.6
Agriculture	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Total	86.6	88.7	88.8	88.2	90.5	92.4	94.8

Note: Emissions reported are based on a "business as usual" projection.
Source: BAAQMD, 2015, op. cit.

2. Regulatory Framework

The federal, state, and local regulations related to greenhouse gas emissions that are relevant to the proposed project are described below.

[10] Bay Area Air Quality Management District (BAAQMD), 2010, op. cit.

a. Federal Regulations

There are no federal regulations regarding GHG emissions applicable to the proposed project.

The U.S. Supreme Court ruled on April 2, 2007 that CO_2 is an air pollutant as defined under the Clean Air Act, and that the U.S. Environmental Protection Agency (EPA) has the authority to regulate emissions of GHGs. The EPA made two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- **Endangerment Finding:** The current and projected concentrations of the six key well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF6) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, these findings were a prerequisite for implementing GHG emissions standards for vehicles. In collaboration with the National Highway Traffic Safety Administration, the EPA finalized emission standards for light-duty vehicles (2012-2016 model years) in May of 2010 and heavy-duty vehicles (2014-2018 model years) in August of 2011.

b. State Regulations

Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, requires California to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 directs the CARB to develop and implement regulations that reduce statewide GHG emissions, institute a schedule to meet the emissions target, and develop tracking, reporting, and enforcement tools to ensure that California achieves the required emission reductions.

CARB and other state agencies have identified measures to achieve the AB 32 GHG emission reduction goal of meeting statewide 1990 GHG emissions levels by 2020. Specifically, in December 2008 CARB adopted the AB 32 Scoping Plan which outlines a statewide strategy to achieve AB 32 goals. At the regional level, in response to Senate Bill 375, the Bay Area and other major metropolitan areas in California have developed Sustainable Communities Strategies to integrate land use and transportation planning in order to reduce future motor vehicle travel and decrease GHG emissions. In addition, BAAQMD is implementing a wide range of programs that promote energy efficiency, reduce vehicle miles traveled, and develop alternative sources of energy.

Senate Bill (SB) 32, which would require that California reduce its greenhouse gas emissions to 40 percent below 1990 levels by 2030, passed the legislation in 2016. The bill piggybacks on AB32, the California Global Warming Solutions Act of 2006, which calls for California to reduce greenhouse gases to 1990 levels by 2020. Under SB 32, the State Air Resources Board is required to adopt rules and regulations in an open public process to achieve the maximum, technologically feasible, and cost-effective greenhouse gas emissions reductions.

c. Bay Area Air Quality Management District

In 2010, BAAQMD developed and adopted GHG thresholds of significance that were incorporated into the 2011 *CEQA Air Quality Guidelines*.[11] The GHG thresholds are designed to help lead agencies in the SFBAAB assess GHG emissions from new projects and meet the GHG emission reduction goals of AB 32. As discussed in Section V.B, *Air Quality*, the 2011 *CEQA Air Quality Guidelines* were challenged in the Alameda County Superior Court. Since the adoption process and scientific soundness of the thresholds have not been challenged, BAAQMD's thresholds of significance were used in conjunction with the updated 2012 *CEQA Air Quality Guidelines*[12] to analyze impacts from GHG emissions for the proposed project.

d. Local Regulations

The City's plans and policies related to greenhouse gas emissions are provided below.

(1) Foster City Climate Action Plan

In February 2016, the City of Foster City adopted a Climate Action Plan that aims to satisfy the AB 32 GHG emission reduction goals. The Climate Action Plan consists of goals, policies, and measures that would reduce GHG emissions from a wide range of sources and promote and increase sustainability within the City. The improvements and implementation of the measures contained in the Climate Action Plan would primarily consist of energy efficiency upgrades, sidewalk connectivity, tree planting, the use of on-site solar energy generation, and other measures to reduce GHGs within areas of the City that have been previously developed.[13]

The Climate Action Plan includes all of the elements identified under CEQA Guidelines Section 15183.5(b)(1) and, therefore, can act as a tiering document for analyzing GHG emissions of future development pursuant to CEQA guidelines 15183.5(b)(2). Specifically,

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[11] Bay Area Air Quality Management District (BAAQMD), 2011. *California Environmental Quality Act Air Quality Guidelines*. May.

[12] Bay Area Air Quality Management District (BAAQMD), 2012a. *California Environmental Quality Act Air Quality Guidelines*. May.

[13] City of Foster City, 2015b. *Foster City General Plan Update and Climate Action Plan Final Environmental Impact Report*. September.

the Climate Action Plan complies with the provisions of CEQA Guidelines Section 15183.5(b)(1) by providing the following:

- A quantified inventory of GHG emissions;
- A level, equivalent to the State's AB 32 goals, below which activities subject to the plan will not make a cumulatively considerable contribution to GHG impacts;
- Analysis of GHG emissions associated with specific actions;
- Performance standards to achieve specified emissions goals; and
- Mechanisms to monitor the plan's progress.

(2) Foster City General Plan

The adopted City of Foster City General Plan identifies the following policies related to greenhouse gases within Chapter 3, Land Use and Circulation Element (adopted in 2016) that are relevant to the proposed project:

> *Policy LUC-E-8: Pedestrian, Bicycle and Neighborhood Electric Vehicle (NEV) Friendly Design.* Encourage bicycling, walking and use of NEVs instead of driving automobiles to reduce greenhouse gas emissions, save money on fuel and maintenance, and foster a healthier population. Prioritize pedestrian and bicycle-friendly improvements including bike lanes on main streets, an urban bike-trail system, bike parking, pedestrian crossings, and associated master plans with new or modified development, as appropriate.

3. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to greenhouse gas emissions that could result from implementation of the proposed project. Included are (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the greenhouse gas emissions impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on climate change if it would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

The significance criteria were evaluated based on the BAAQMD's thresholds of significance[14] and 2012 *CEQA Air Quality Guidelines* (described in more detail below).[15]

b. Less-Than-Significant Greenhouse Gas Emissions Impacts

Implementation of the proposed project would result in less-than-significant impacts described below. Since these impacts would not exceed the significance criteria described above, no mitigation measures are necessary for these less-than-significant impacts.

(1) Greenhouse Gas Emissions Impacts on the Environment

For land use development projects, the BAAQMD's threshold of significance for operational-related GHG emissions is compliance with one of the following:

- A qualified GHG Reduction Strategy;
- Annual emissions less than 1,100 metric tons per year (MT/yr) of CO_2e; or
- Annual emissions less than 4.6 MT/yr of CO_2e per service population.

These thresholds of significance were established based on the AB 32 GHG emission reduction goals. The City of Foster City's Climate Action Plan is a qualified GHG Reduction Strategy that meets the requirements for tiering the analysis of GHG emissions described under State CEQA Guidelines Section 15183.5(b)(2). Operation of the project under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would not generate any GHG emissions nor conflict with the implementation of City-wide GHG emission reduction measures, such as development of pedestrian and bicycle friendly transportation designs (e.g., San Francisco Bay Trail). Therefore, operation of the proposed project under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would be consistent with the City's Climate Action Plan and result in a less-than-significant impact on global climate change.

The BAAQMD does not have a threshold of significance for GHG emissions during construction because these emissions represent a relatively small portion (less than two percent) of the overall GHG emissions inventory in the Bay Area.[16] However, the BAAQMD recommends calculating GHG emissions to disclose the emissions levels. The project GHG emissions during construction were estimated from off-road equipment and on-road vehicles (workers, vendors, and haulers) for the maximum construction scenario (2100 Sea Level Rise scenario). The type of equipment and vehicles that would be used during project construction activities are summarized in *Section V.B, Air Quality* (Tables V.B-4 and V.B-5) and additional details are included in Appendix B.

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[14] Bay Area Air Quality Management District (BAAQMD), 2011, op. cit.

[15] Bay Area Air Quality Management District (BAAQMD), 2012, op. cit.

[16] Bay Area Air Quality Management District (BAAQMD), 2009. *Revised Draft Options and Justification Report; California Environmental Quality Act Thresholds of Significance.* October.

The total emissions of GHGs from construction of the 2100 Sea Level Rise scenario are summarized in Table V.F-3. Based on guidance from other California air districts (South Coast and Sacramento), the total emissions of GHGs during construction were amortized over the expected operational life of the project under both the 2050 Sea Level Rise (30 years) and 2100 Sea Level Rise scenarios (80 years) and then compared to the BAAQMD's operational threshold of significance of 1,100 MT/yr of CO_2e. The amortized GHG emissions during construction of the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios are substantially less than the BAAQMD's operational threshold of significance. This comparison demonstrates that the relatively short-term and low levels of GHG emissions generated during construction under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would have a less-than-significant impact on global climate change.

(2) Conflicts with Applicable GHG Reduction Plans

As discussed above, the project would be consistent with the City's Climate Action Plan, which aims to meet the AB 32 GHG reduction goals. Furthermore, a comparison of the project's amortized GHG emissions during construction to BAAQMD's operational threshold of significance (Table V.F-3) demonstrates that the project's relatively short-term and low levels of GHG emissions would not conflict with AB 32 GHG emission reduction goals. Therefore, project development under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would have a less-than-significant impact on applicable plans, policies, or regulations related to GHG emission reductions in the SFBAAB.

c. Significant Greenhouse Gas Emissions Impacts and Mitigation Measures

Implementation of the proposed project would not result in any GHG emissions impacts; all impacts would be less than significant as discussed above.

d. Cumulative Greenhouse Gas Emissions Impacts

GHG impacts are, by their nature, cumulative impacts because one project by itself cannot cause global climate change. The City's GHG thresholds of significance pertain to a project's contribution to cumulative impacts. Based on the analysis above, the project's contribution to a GHG impact would not be cumulatively considerable.

TABLE V.F-3 SUMMARY OF GHG EMISSIONS DURING PROJECT CONSTRUCTION

Emission Source	Total Construction Emissions	Amortized Construction Emissions: 2050 Sea Level Rise Scenario	Amortized Construction Emissions: 2100 Sea Level Rise Scenario
Units	MT CO_2e/year	MT CO_2e/year	MT CO_2e/year
Off-Road Equipment			
Phase 1: Sheet Piling	1,060	35	13
Phase 2: Levee Fill and Trail Reconstruct	1,283	43	16
Phase 3: Landscaping	61	2	1
On-Road Vehicles			
Phase 1: Sheet Piling	40	1	0.5
Phase 2: Levee Fill and Trail Reconstruct	470	16	6
Phase 3: Landscaping	9	0.3	0.1
Total Emissions	**2,923**	**97**	**37**
BAAQMD's Operational Threshold	NA	1,100	1,100
Thresholds Exceedance?	NA	No	No

Notes: NA = not applicable
The BAAQMD does not have a threshold of significance for construction emissions.
Total construction emissions based on 2100 Sea Level Rise scenario.
Construction emissions for 2050 Sea Level Rise and 2100 Sea Level Rise scenarios amortized over 30 and 80 years, respectively.
Source: See Appendix B.

G. HAZARDS AND HAZARDOUS MATERIALS

This section describes the environmental setting at the proposed project site (the site) with regard to hazards and hazardous materials; discusses the relevant federal, state, regional, and local regulations;[1] identifies the impacts related to hazards and hazardous materials that could result from implementation of the proposed project; and provides mitigation measures to reduce significant impacts to a less-than-significant level, where appropriate. The evaluation in this section is based on a review of available information included with the project application, regulatory agency databases, and other published materials, as well as a site reconnaissance conducted by BASELINE Environmental Consulting (preparers of this Draft EIR section) in May 2016.

1. Environmental Setting

This subsection discusses the hazards and hazardous materials environment at and in the vicinity of the site, and summarizes the regulatory framework for hazardous materials and applicable worker health and safety requirements.

a. Hazardous Materials Existing Conditions

Regulatory agency databases maintained by the State Water Resources Control Board and Department of Toxic Substances Control were reviewed to evaluate whether hazardous materials releases in the vicinity of the project site could result in impacts to the proposed project. No environmental investigations have been conducted for the existing levee portion of the site because the levee's use as a pedestrian path does not involve hazardous materials use or storage to warrant such an investigation. In addition, no environmental investigations have been performed for the proposed staging areas of the project site, except for the staging area located in the City of Foster City's Corporation Yard, as discussed below.

[1] The California Health and Safety Code defines a hazardous material as, "...any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment" (California Health and Safety Code Section 25501).

Regulatory Agency Database Review

Review of the California Department of Toxic Substances Control (DTSC) EnviroStor database identified no hazardous materials release sites near the project site.[2]

Review of the State Water Resources Control Board (State Water Board) GeoTracker database revealed that hazardous materials releases from leaking underground storage tanks (LUSTs) have occurred at: (1) the City's Corporation Yard, located at 3470 East 3rd Avenue (this yard contains one of the proposed staging areas and is located immediately south across 3rd Avenue from the existing levee); and (2) a property located at 1455 Beach Park Boulevard immediately west across Beach Park Boulevard from the existing levee. GeoTracker also lists a hazardous materials release Cleanup Program site at 850 Lincoln Center Drive immediately south across 3rd Avenue from the existing levee. All three of these cases – both LUST sites and the Cleanup Program site – are closed cases, indicating that further investigation or cleanup are not required by regulatory agencies. The use of the City's Corporation Yard as a staging area would not involve subsurface excavations; therefore, potential residual contamination in the subsurface would not impact the proposed project. Because the other LUST site and Cleanup Program site discussed above are closed cases and are located off-site, the past hazardous materials releases at these properties should not pose an environmental concern for the proposed project. GeoTracker does not list any other hazardous materials release sites within close proximity to the project site.[3]

Site Reconnaissance

A visual reconnaissance of the project site was conducted by BASELINE Environmental Consulting in May 2016. No signs of hazardous materials use, storage, or disposal were observed in the vicinity of the project site, except for: (1) a shed located within a California Department of Transportation (Caltrans) yard south of the base of the San Mateo Bridge/SR 92 (this shed appears to be storing hazardous materials, based on the presence of a National Fire Protection Association placard on the shed); and (2) a vehicle fueling station located northeast of the proposed staging area within the City's Corporation Yard. No indications of hazardous materials releases were observed at these locations.

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[2] California Department of Toxic Substances Control (DTSC), 2016. Envirostor Map of Foster City. http://www.envirostor.dtsc.ca.gov/public/mapfull.asp?global_id=&x=-119&y=37&zl=18&ms=640, 480&mt=m&findaddress=True&city=Foster%20City&zip=&county=&federal_superfund=true&state_response=true &voluntary_cleanup=true&school_cleanup=true&ca_site=true&tiered_permit=true&evaluation=true&military_evaluation=true&school_investigation=true&operating=true&post_closure=true&non_operating=true, accessed March 30.

[3] State Water Resources Control Board, 2016. Geotracker Map of Foster City. http://geotracker.waterboards.ca.gov/map/?CMD=runreport&myaddress=foster+city, accessed March 30.

b. Subsurface Conditions

Beneath the existing levee, the subsurface conditions generally consist of approximately 3–8 feet of artificial fill overlying young Bay Mud/marsh deposits. The fill materials are generally sandy and gravelly and varies along the levee alignment in both composition and consistency. Silty clay fill present in some areas appears to be native Bay Mud that was reused as levee fill. Groundwater was encountered at depths of approximately 7–10 feet below the existing levees. Fluctuations in the groundwater level may occur due to variations in rainfall, irrigation practices, and tides.[4] The source and quality of much of the fill materials used to construct the existing levees could not be identified; therefore, fill materials impacted with hazardous materials could be present within the existing levees. Soil near the San Mateo Bridge/SR 92 (including in the vicinity of the old San Mateo Bridge/SR 92) could be impacted with aerially deposited lead from historic vehicle emissions.

The upland area surrounding the Sea Cloud Phase II sedimentation basin consists of fill material overlying Bay Mud.[5] The source and quality of this fill material could not be identified; therefore, fill materials impacted with hazardous materials could be present within the upland area surrounding the Sea Cloud Phase II sedimentation basin. No subsurface information specific to other staging areas of the proposed project was found; however, in the 1960s, hydraulic sand fills were placed over Bay Mud to raise site grades within much of Foster City.[6] According to subsurface investigations at the property located at 850 Lincoln Center Drive, which is near several staging areas, the area is underlain by approximately 3–8 feet of artificial fill over Bay Mud deposits.[7]

c. Surrounding Airports

The project site is located approximately 1.2 miles north of the San Carlos Airport and approximately 4.5 miles southeast of San Francisco International Airport (SFO). The project site is not located near any private use airstrips. The entire project site is located within Airport Influence Area (AIA) Area A for the San Carlos Airport, where requirements for real estate disclosure are mandatory due to potential noise issues. The southern portion of the project site is located within AIA Area B of the San Carlos Airport and within 10,000 feet of a runway of the San Carlos Airport where proposed structures may require Federal Aviation Administration (FAA) notification. Proposed developments within AIA Area B of the San Carlos Airport are subject to review by the City/County Association of

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[4] ENGEO, 2009. *Geotechnical Report, Foster City Levees Pedway Improvements.* August 20.

[5] Hultgren – Tillis Engineers, 2002. *Geotechnical Investigation, Sea Cloud Park Restoration Project, Foster City, California.* February 28.

[6] Ibid.

[7] Langan Treadwell Rollo, 2014. *Updated Phase I Environmental Site Assessment, Lincoln Center Campus, Foster City, California.* November 21.

Governments of San Mateo County (C/CAG), and structures within 10,000 feet of a runway that have a proposed height exceeding an imaginary surface with a 50:1 (horizontal: vertical) slope from the nearest point of the nearest runway require FAA notification.[8]

The northern and eastern portions of the project site are located within the outer boundary of the Terminal Procedures approach and One-Engine Inoperative departure surfaces to SFO as well as the SFO AIA Area B. The highest obstruction permitted within SFO AIA B is 210 feet.[9]

2. Regulatory Framework

This subsection outlines the regulatory framework for hazardous materials and hazardous waste as well as with regard to worker health and safety.

a. Hazardous Materials and Hazardous Waste

(1) Federal, State, Regional, and Local

The use, storage, and disposal of hazardous materials—including management of contaminated soils and groundwater—is regulated by numerous local, state, and federal laws and regulations. At the federal level, the United States Environmental Protection Agency (EPA) administers hazardous materials and hazardous waste regulations. The relevant state agency—the California Environmental Protection Agency—includes the DTSC and the State Water Board (which operates via nine Regional Water Quality Control Boards [RWQCBs]). The San Francisco Bay RWQCB (representing Region 2) and the San Mateo County Environmental Health Division (SMCEHD) have jurisdiction at the regional/local level relative to the project site.

Each federal, state, and regional agency's jurisdiction and involvement in the management of hazardous materials and wastes is described below.

Federal

The EPA is the federal agency responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials and hazardous waste. The federal regulations are primarily codified in Title 40 of the Code of Federal Regulations. The

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[8] City/County Association of Governments of San Mateo County, 2015. Comprehensive Airport Land Use Compatibility Plan for the Environs of San Carlos Airport, October. http://ccag.ca.gov/plansreportslibrary/airport-land-use/.

[9] City/County Association of Governments of San Mateo County, 2012b. Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport, November. http://ccag.ca.gov/plansreportslibrary/airport-land-use/.

legislation includes the Resource Conservation and Recovery Act of 1976 (RCRA); the Superfund Amendments and Reauthorization Acts of 1986; and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980. The EPA provides oversight for site investigation and remediation projects, and has developed protocols for sampling, testing, and evaluation of solid wastes.[10]

State

The following state agencies, described below, regulate hazardous materials and waste that may occur on or around the project site.

- **Department of Toxic Substances Control.** In California, the DTSC is authorized by the EPA to enforce and implement federal hazardous materials laws and regulations. California regulations pertaining to hazardous materials are equal to or exceed the federal regulation requirements. Most state hazardous materials regulations are contained in Title 22 of the California Code of Regulations (CCR). The DTSC generally acts as the lead agency for soil and groundwater cleanup projects that affect public health, and establishes cleanup levels for subsurface contamination that are equal to or more restrictive than federal levels. The DTSC has also developed land disposal restrictions and treatment standards for hazardous waste disposal in California.
- **State Water Resources Control Board.** The State Water Board enforces regulations on implementation of underground storage tank (UST) programs. It also allocates monies to eligible parties that request reimbursement of funds to clean up soil and groundwater pollution from UST leaks. The State Water Board also enforces the Porter-Cologne Water Quality Act through its nine RWQCBs, including the San Francisco Bay RWQCB, described below.

Regional

The following regional agencies have regulatory authority over the proposed project's management of hazardous materials and waste.

- **San Francisco Bay Regional Water Quality Control Board.** The nine RWQCBs provide for the protection of Waters of the State in accordance with the Porter-Cologne Water Quality Act of 1969. The San Francisco Bay RWQCB can act as lead agency to provide oversight of sites in Region 2 where the quality of groundwater or surface waters is threatened. It has the authority to require investigations and remedial actions. The San Francisco Bay RWQCB has developed Environmental Screening Levels (ESLs) to help

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[10] United States Environmental Protection Agency (EPA), 2007. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846 On-Line*, updated September 4, 2013. http://www.epa.gov/epawaste/hazard/testmethods/sw846/online/index.htm, accessed December 8, 2014.

expedite the preparation of environmental risk assessments at sites where contaminated soil and groundwater have been identified.

- **San Mateo County Health Department, Environmental Health Division.** The SMCEHD is the primary agency responsible for local enforcement of state and federal laws pertaining to hazardous materials management. It has jurisdiction in Foster City. SMCEHD is a Certified Unified Program Agency; it is responsible for the Hazardous Materials Business Plan Program; the local hazardous waste generator program; UST management; investigation of leaking USTs; oversight of remediation of contaminated sites; and the California Accidental Release Program for highly toxic, flammable, or explosive materials. SMCEHD also administers a County Household Hazardous Waste Program to educate the public about the dangers of toxic household wastes and to provide for proper disposal of household hazardous wastes.

Local

The City's plans and policies related to hazards and hazardous materials and wastes are provided below.

Foster City General Plan

The 1995 Safety Element of the Foster City General Plan[11] contains the following safety goals, policies, and programs related to hazardous materials, fire, and emergency preparedness.

> *Goal S-C: Protect from Fire and Dangerous Conditions.* Protect the community from unreasonable risk to life and property caused by fires and dangerous conditions.
>
> *Goal S-D: Prepare to Respond to Emergencies*. Minimize potential damage to life, environment and property through timely, well-prepared and well-coordinated emergency preparedness, response plans, and programs.
>
> *Policy* S-6: *Minimize Loss of Life, Injuries, and Property Damage Due to Fires.* The City will minimize loss of life, injuries, and property damage due to fires through review of development proposals, public education, and maintenance of well-trained fire suppression personnel.
>
> *Policy S-7: Hazardous Materials.* The City will protect the community from unreasonable risks associated with hazardous materials.
>
> *Policy S-9: Emergency Response.* The City will prepare to respond to emergencies through the City's Emergency Plan, training, and other measures.

[11] City of Foster City, 1995. *General Plan, Chapter 7, Safety Element*. Adopted October.

Program S-p: Emergency Response. The City will prepare to respond to emergencies through the use of established procedures, programs of on-going training, periodic exercises of the City's Emergency Plan, and mutual aid agreements.

Program S-q: Emergency Plan. The city will maintain the City's Emergency Plan indicating responsibilities and procedures for responding to an emergency.

Emergency Evacuation Plans

According to the Safety Element of the Foster City General Plan, evacuation routes can include a roadway, waterway, or trail that will allow the orderly removal of people and possessions from an area endangered due to floods, hazardous materials, spills, or other emergency. The major evacuation routes in Foster City include California State Route (SR) 92, East Hillsdale Boulevard, and Foster City Boulevard to East 3rd Avenue, and minor evacuation routes include the trail to Belmont and levee pedway under SR 92 to East 3rd Avenue. An Evacuation Route Map presented in the Safety Element of the Foster City General Plan indicates that Beach Park Boulevard and Edgewater Drive are also evacuation routes.[12]

(2) Worker Health and Safety

Worker health and safety is regulated at the federal level by the Occupational Safety and Health Administration (OSHA). The federal Occupational Safety and Health Act of 1970 authorizes the states to establish their own safety and health programs with OSHA approval. Worker health and safety protections in California are regulated by the California Occupational Safety and Health Administration (Cal/OSHA). California standards for workers dealing with hazardous materials are contained in 8 CCR; they include practices for all industries (General Industrial Safety Orders), as well as specific practices for construction. Workers at hazardous waste sites (or workers who may be exposed to hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to OSHA Hazardous Waste Operations and Emergency Response regulations. Additional regulations have been developed for construction workers potentially exposed to lead and asbestos. Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

3. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to hazards and hazards materials that could result from implementation of the proposed project. Included are (1) the

[12] City of Foster City, 1995, op.cit.

criteria of significance (consistent with Appendix G of the CEQA Guidelines), which establish the thresholds for determining whether an impact is significant; and (2) the hazards and hazardous materials impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

A significant hazardous materials or public health and safety impact would occur if the project would:

- Create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials.
- Create a significant hazard to the public or environment through reasonably foreseeable upset or accident conditions involving the release of hazardous materials into the environment.
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼-mile of an existing or proposed school.
- Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would result in a safety hazard for people residing or working in the area.
- Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.
- Result in an increased risk of exposure to wildland or urban fire hazards.
- Result in a safety hazard for people residing or working within an airport land use plan area or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport.
- Result in a safety hazard for people residing or working within the vicinity of a private airstrip.

b. Less-Than-Significant Hazards and Hazardous Materials Impacts

The following discussion examines potential less-than-significant impacts of the proposed project.

(1) Routine Transport, Storage, Use, and Disposal of Hazardous Materials

The proposed land use as a levee and pedestrian trail would not involve the routine storage, use, or disposal of hazardous materials during operation of the proposed project.

Hazardous material such as oils, grease, and fuels for construction vehicles and equipment would be transported and used on-site for proposed construction activities. Use of hazardous materials during construction may pose health and safety hazards to construction workers if the materials are improperly handled, or to nearby residents and the environment surrounding the proposed project if the hazardous materials are accidentally released into the environment. Potential impacts associated with accidental releases of hazardous materials into the environment are discussed in the significant impacts subsection below.

The routine handling and use of hazardous materials by construction workers would be performed in accordance with OSHA regulations, which include training requirements for construction workers and a requirement that hazardous materials are accompanied by manufacturer's Safety Data Sheets (SDSs). Cal/OSHA regulations include requirements for protective clothing, training, and limits on exposure to hazardous materials. Compliance with these existing regulations would ensure that construction workers are protected from exposure to hazardous materials that may be used on-site.

Because the proposed project would result in soil disturbance greater than 1 acre, management of hazardous materials during construction activities would be subject to the requirements of the Stormwater Construction General Permit, which requires preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that includes hazardous materials storage requirements. For example, construction site operators must store chemicals in watertight containers (with appropriate secondary containment to prevent any spillage or leakage) or in a storage shed (completely enclosed).

Construction of the proposed project would result in the generation of various waste materials that would require recycling and/or disposal, including some waste materials that may be classified as hazardous waste. Hazardous materials would be transported by a licensed hazardous waste hauler and disposed of at facilities that are permitted to accept such materials as required by the United States Department of Transportation (DOT), RCRA, and state regulations.

In 1990 and 1994, the federal Hazardous Material Transportation Act was amended to improve the protection of life, property, and the environment from the inherent risks of transporting hazardous material in all major modes of commerce. The DOT developed hazardous materials regulations, which govern the classification, packaging, communication, transportation, and handling of hazardous materials, as well as employee training and incident reporting. The transportation of hazardous materials is subject to both RCRA and DOT regulations. The California Highway Patrol, Caltrans, and the DTSC are responsible for enforcing federal and state regulations pertaining to the transportation of hazardous materials.

Compliance with existing regulations would ensure that potential impacts from the routine transport, use, or disposal of hazardous materials during construction of the proposed project would be less than significant.

(2) Emit Hazardous or Acutely Hazardous Materials within ¼ Mile of a School

The project site is located within ¼-mile of several schools, including Audubon Elementary School, Bowditch Middle School, San Mateo-Foster City Special Education Preschool, and Kid's Connection Elementary School.[13] However, the proposed project would not involve the handling of acutely hazardous materials and safe handling of other types of hazardous materials is required by existing regulations. Therefore, the risks associated with emissions of hazardous materials within ¼-mile of a school are considered less than significant.

(3) Located on a List of Hazardous Materials Sites Compiled Pursuant to Government Code Section 65962.5

The Foster City Corporation Yard was identified as a leaking underground storage tank (LUST) cleanup site on GeoTracker,[14] and is therefore included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. This LUST case has been closed and the proposed use of this property as a staging area would not involve disturbance of the subsurface; therefore, use of this property as a staging area would not result in a safety hazard for people residing or working in the area, as potential residual contamination that could be present in the subsurface would not be disturbed. No other properties within the project site have been identified as being included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. This potential impact is therefore less than significant.

(4) Wildland/Urban Fires

The project site is located along the coastline of an urbanized area and is not situated near wildlands or very high fire hazard severity zones.[15] Vegetation adjacent to the project site consists primarily of ice plant on the landward side of the levee and minimal low lying vegetation or marshy vegetation on the bayside of the levee. These types of vegetation are not susceptible to fire. There are a few areas adjacent to the project site which are more vegetated with low lying plants, which could be susceptible to fire hazards, including the section of land bayside of segment 4 of the proposed project and the area on the landward side of segment 2 of the proposed project. The proposed project would not

[13] California Department of Education (CDE), 2016. *California Schools Directory Search.* http://www.cde.ca.gov/re/sd/, accessed June 9.

[14] State Water Resources Control Board, 2016, op. cit.

[15] CalFire, 2008. *Fire Hazard Severity Zones, San Mateo County.* November 24. http://frap.fire.ca.gov/webdata/maps/san_mateo/fhszl_map.41.pdf, accessed June 10.

impede emergency response access for firefighting on the landward side of segment 2 of the proposed project, and based on conversations with the Foster City Fire Department,[16] with a maximum wall height relative to the pedestrian trail of 3.5 feet, firefighting activities can be accomplished by carrying fire hoses across the floodwall on foot. Since the area on the bayside of the floodwall is relatively small, carry distances would be short and should not significantly increase response times. Engines would draw water from fire hydrants positioned on the opposite side of Beach Park Boulevard, as is now the case. Therefore the proposed project would not increase the risk of exposure to fire hazards and this potential impact is less than significant.

(5) Aviation Hazards

The southern portion of the proposed project is located within AIA Area B of the San Carlos Airport; therefore, the proposed project would be subject to review by C/CAG to ensure that aviation hazards are not created by the proposed project.[17] The proposed project is not expected to include any land uses that would cause a hazard to air navigation within the vicinity of SFO or San Carlos Airport.[18] Additionally, the site is not in the vicinity of any private air strips. The proposed project would therefore have a less-than-significant impact associated with aviation hazards.

c. Significant Hazards and Hazardous Materials Impacts

The following discussion examines potential significant impacts of the proposed project.

(1) Accidental release of hazardous materials into the environment

<u>Impact HAZ-1</u>: Levee project construction period activities could result in accidental releases of hazardous materials and/or the disturbance and reuse of soil potentially impacted with hazardous materials that could result in impacts to construction workers, the public, and/or the environment. (S)

An accidental release of hazardous materials (e.g., oils, grease, and fuels) during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. As discussed above, the proposed project would be subject to the requirements of the Construction General Permit, which requires

[16] Hegwer, Gary, 2016. Deputy Fire Chief, Foster City, California. Personal Communication with Marlene Subhashini, Foster City Senior Planner. August 29.

[17] City/County Association of Governments of San Mateo County, 2015, op. cit.

[18] Ibid. Land uses that could cause a hazard to air navigation include: 1) tall objects 2) sources of glare; 3) distracting lights that could be mistaken for airport identification lighting; 4) sources of dust, smoke, or water vapor; 5) sources of electrical interference; 6) sources of significant thermal plumes; and 7) any land use that would attract large concentrations of wildlife, particularly flocks of birds.

preparation and implementation of a SWPPP to reduce the risk of spills or leaks from reaching the environment, including procedures to address minor spills of hazardous materials. Measures to control spills, leakage, and dumping must be addressed through structural as well as nonstructural BMPs, as required by the Construction General Permit. For example, equipment and materials for cleanup of spills must be available on-site, and spills and leaks must be cleaned up immediately and disposed of properly. BMPs also include treatment requirements, operating procedures, and practice to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

As discussed above, the transportation of hazardous materials is subject to both RCRA and DOT regulations. If a discharge or spill of hazardous materials occurs during transportation, the transporter is required to take appropriate immediate action to protect human health and the environment (e.g., notify local authorities and contain the spill), and is responsible for the discharge cleanup.

As discussed in the Environmental Setting Section above, fill materials impacted with hazardous materials could be present within the existing levees, and soil near the San Mateo Bridge/SR 92 (including in the vicinity of the old San Mateo Bridge/SR 92) could be impacted with aerially deposited lead. Disturbance and reuse of soil potentially impacted with hazardous materials during construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials.

In addition to compliance with the regulations discussed above, implementation of the following mitigation measure would ensure that potential impacts from an accidental release of hazardous materials and/or disturbance of soil impacted with hazardous materials is less than significant.

> Mitigation Measure HAZ-1: Sampling and characterization of soil shall be performed prior to excavation for conventional flood wall construction, including in the area beneath the San Mateo Bridge/SR 92 where aerially deposited lead may be present in soil. The soil sampling and analytical methods shall be selected by a qualified environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional, then submitted to the City of Foster City Public Works Department and/or the project team and the appropriate regulatory agency, if necessary. The environmental professional shall provide recommendations to the project contractor and the City Fire Prevention Bureau, as applicable, for review and approval regarding soil/waste management, worker health and safety requirements, and regulatory agency notifications, in accordance with local, state, and federal requirements. Any recommendations by the environmental professional shall be required to be implemented by the project contractor.

A Construction Risk Management Plan (CRMP) shall be prepared by the project contractor to protect construction workers, the public, and the environment from hazardous materials, including potential unknown contamination in the subsurface of the project site. The CRMP shall include the following:

1) Procedures for evaluating, handling, storing, testing and disposing of soil during project excavation activities.
2) A project-specific Health and Safety Plan that identifies hazardous materials to be used at the project site (e.g., oils, grease, and fuels) and hazardous materials identified in soil through sampling; describes required health and safety provisions and training for all workers potentially exposed to hazardous materials in accordance with state and federal worker safety regulations; and designates the personnel responsible for Health and Safety Plan implementation.
3) A contingency plan that shall be applied if previously unknown hazardous materials are encountered during construction activities. The contingency plan shall be developed by the contractor(s), with the approval of the City and/or appropriate regulatory agency, prior to demolition or issuance of the first building permit. The contingency plan shall include provisions that require collection of soil and/or groundwater samples in the newly discovered affected area by a qualified environmental professional prior to further work, as appropriate. The samples shall be submitted for laboratory analysis by a state-certified laboratory under chain-of-custody procedures. The analytical methods shall be selected by the environmental professional. The analytical results of the sampling shall be reviewed by the qualified environmental professional and submitted to the appropriate regulatory agency, if appropriate. The environmental professional shall provide recommendations, as applicable, regarding soil/waste management, worker health and safety training, and regulatory agency notifications, in accordance with local, state, and federal requirements. Work shall not resume in the area(s) affected until these recommendations have been implemented under oversight by the City or regulatory agency, as appropriate.
4) Designated personnel responsible for implementation of the CRMP.

The CRMP shall be submitted to the City of Foster City Public Works Department and/or the project team to be reviewed and approved by the Foster City Fire Prevention Bureau for review and approval prior to construction activities.

In addition, the following measures shall be implemented:

- The contractor(s) shall designate storage areas suitable for hazardous materials delivery, storage, and waste collection. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and federal regulations. In addition, an accurate up-to-date inventory, including Safety Data Sheets, shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident.

- All maintenance and fueling of vehicles and equipment shall be performed in a designated, bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured.
- An Emergency Preparedness and Response Procedures shall be developed and implemented by the contractor(s) for emergency notification in the event of an accidental spill or other hazardous materials emergency during project site preparation and development activities. These procedures shall include evacuation procedures, spill containment procedures, and required personal protective equipment, as appropriate, in responding to the emergency. The contractor(s) shall submit these procedures to the City Fire Department for approval prior to demolition or development activities.
- If the presence of subsurface hazardous materials is confirmed at the project site, site remediation may be required by the applicable state or local regulatory agencies. Specific remedies would depend on the extent and magnitude of contamination and requirements of the regulatory agency(ies). Under the direction of the regulatory agency(ies) and the City, a Site Remediation Plan shall be developed by the project contractor, if determined necessary by the regulating agency(ies) and implemented. The Site Remediation Plan shall (1) specify measures to be taken to protect workers and the public from exposure to the potential hazards; and (2) certify that the proposed remediation would protect the public health in accordance with local, state, and federal requirements, considering the land use proposed. Excavation and earthwork activities associated with the proposed project shall not proceed until the Site Remediation Plan has been reviewed and approved by the regulatory oversight agency and is on file with the City.
- Engineering fill shall be tested prior to being brought on-site to ensure that it would not pose an unacceptable risk to human health or the environment. Threshold criteria for acceptance of engineered fill shall be selected based on screening levels and protocols developed by regulatory agencies for protection of human health and leaching to groundwater (e.g., ESLs). The engineered fill shall be characterized by representative sampling in accordance with the US Environmental Protection Agency's SW-846 Test Methods and in accordance with the Department of Toxic Substances Control's Information Advisory for Clean Imported Fill Material (2001 or most recent version). Fill testing shall be performed by a qualified environmental professional and demonstrated to meet the appropriate threshold

criteria. The results of the sampling and waste characterization shall be submitted by the contractor(s) to the City prior to construction.

- The contractor shall prepare a Waste Disposal and Hazardous Materials Transportation Plan for City approval prior to construction activities and implement the Plan during demolition and construction activities. This plan shall describe the analytical methods for characterizing wastes and the handling methods required to minimize the potential for exposure, and shall establish procedures for the safe storage of contaminated materials and stockpiling of soils. The required disposal method for contaminated materials, the approved disposal site, and specific routes used for transport of wastes to and from the project site shall be indicated. The Waste Disposal and Hazardous Materials Transportation Plan may be prepared as an addendum to the Waste Management Plan required by Chapter 15.44 (Ordinance 523) of the Foster City Municipal Code.
- Hazardous materials and wastes generated during demolition, grading, and trenching activities, shall be removed, managed, and disposed of in accordance with applicable regulations.

Compliance with existing regulations and implementation of **Mitigation Measure HAZ-1** would ensure that impacts associated with potential releases of hazardous materials are less than significant. (LTS)

(2) Interfere with an adopted emergency response plan or emergency evacuation plan

<u>Impact HAZ-2:</u> **Construction of the improved levee could interfere with the use of the emergency response/evacuation routes. (S)**

An existing section of the Bay Trail is a designated fire road that connects the existing levee pedestrian path from near the southern end of Baffin Street in Foster City to the east end of Farallon Drive in the city of Belmont. This fire access road/trail is designated as a minor evacuation route in the Safety Element of the Foster City General Plan. A similar emergency egress/fire access road is located near Lakeside Drive at East 3rd Avenue. The Foster City Fire Department requires emergency access from East 3rd Avenue to the beach near Baywinds Park for water rescue. The existing levee pedestrian path that crosses beneath the San Mateo Bridge/SR 92 is also designated as a minor evacuation route in the Safety Element of the Foster City General Plan. The O'Neill Slough Trail, which connects the southwest end of the existing levee pedestrian path to Belmont, is not currently designated as an evacuation route or fire access road; however it could serve as an evacuation route for pedestrians and bicyclists.

The proposed levee improvements in the areas of these trails/fire access roads could interfere with the use of these trails/fire access roads for emergency response and evacuation purposes during construction. This is a potentially significant impact.

> Mitigation Measure HAZ-2*:* Prior to the start of construction, the contractor shall develop a plan to ensure that sufficient access for emergency vehicles, including fire engines and trucks, and emergency evacuation is maintained at all times during construction activities at the fire access roads and evacuation routes impacted by construction of the proposed project, by constructing temporary bypasses adjacent to the fire access roads and evacuation routes. The contractor shall coordinate with the Foster City Police Department and Fire Department to design the temporary bypasses to ensure that they would allow appropriate emergency response and evacuation access. Grading during construction shall proceed so as to always maintain a minimum 12 feet wide path for the fire access roads that can be safely traveled at all times during an emergency. The contractor shall submit the plan to the Foster City Police Department and Fire Department for review and approval. The plan shall outline the notification procedures for informing the Foster City Police Department and Fire Department of when the existing fire access roads and evacuation routes would be blocked and replaced by the temporary bypasses. The plan shall also outline procedures for notification and placement of signage to inform the public of the temporary bypasses for emergency response/evacuation routes.

Implementation of **Mitigation Measures HAZ-2** would ensure that the proposed project has a less-than-significant impact associated with emergency response/evacuation plans during construction.

To facilitate trail access and emergency response/evacuation access during operation of the proposed project, passive automatic flood barriers would be installed on either side of the San Mateo Bridge/SR 92. These flood barriers deploy automatically, lifted by the power of rising floodwaters, to protect the design elevation. They do not require human intervention or power to deploy and would be wide enough to allow access for emergency response vehicles (e.g., fire engines, trucks) and capable of handling the weight of a fire engine. At the access points from the modified levee to the Bay Trail/fire access road to Belmont, the emergency egress/fire access road near Lakeside Drive at East 3rd Avenue, and the O'Neill Slough Trail which connects to Belmont, passive automatic flood barriers or raised grade ramps would be constructed to allow emergency response/evacuation through or over the modified levee. The graded ramps would have vertical curves suitable for equipment passage (including fire engines) and would have a maximum slope of 8 percent at the access points from the modified levee to the emergency egress/fire access road near Lakeside Drive at East 3rd Avenue, and a maximum slope of 5 percent (conforming to ADA requirements) at the access points from the modified levee to the Bay Trail/fire access road to Belmont. The pavement of the fire access road raised grade ramps would be designed for the weight of fire engines, and would be as wide as the existing fire access roads.

Installation of these flood barriers and/or raised grade ramps would ensure that the proposed project would have a less than significant impact associated with emergency response/evacuation plans during operation. (LTS)

d. Cumulative Hazards and Hazardous Materials Impacts

As discussed above, accidents involving hazardous materials releases or soil disturbance that may be impacted with hazardous materials during construction activities could result in adverse effects to construction workers, the public, or the environment. Occurrence of a cumulative effect would require that multiple projects release hazardous materials at the same time in close proximity to each other. Compliance with existing regulations and the implementation of measures such as **Mitigation Measure HAZ-1** would ensure that potential construction period impacts associated with releases of hazardous materials or soil disturbances that may be impacted with hazardous materials are less than significant. Each site, including the proposed project, would be required to comply with existing hazardous materials regulations to reduce the risk of impacts associated with hazardous materials releases. Therefore, the potential for impacts associated with hazardous materials releases from the proposed project to combine with impacts associated with hazardous materials releases from other sites is less than significant. Even if there were the potential for significant cumulative hazards impacts, the project's contribution would be reduced to less than cumulatively considerable through implementation of **Mitigation Measure HAZ-1**.

H. HYDROLOGY AND WATER QUALITY

This section describes the existing hydrological setting for the proposed project site (the site); discusses the federal, state, and local regulations related to water resources that are relevant to the project; assesses potentially significant impacts that could result from implementation of the project; and provides mitigation measures to reduce the identified impacts to a less-than-significant level, where appropriate. The analysis in this section is based on information obtained from: (1) a review of federal, state, and local documents and reports; (2) a review of the information provided as part of the project application; and (3) a reconnaissance of the project alignment conducted in May 2016.

1. Setting

This subsection discusses the existing hydrological setting at and near the project site, the regulations affecting water resources, and local policies and programs related to hydrology and water quality.

a. Climate

The climate in the project vicinity is characterized as Mediterranean, with cool wet winters and warm dry summers. The average annual high temperature is approximately 71ºF, and the average annual low temperature is approximately 47ºF.[1] The mean annual rainfall in the project vicinity for the period of 1906–2012 was approximately 19 inches, and primarily occurred from November through April.[2] During the period of record, annual rainfall varied from approximately 8 inches (in 1976) to approximately 43 inches (in 1983), with a highest one-day precipitation total of approximately 4.9 inches (on October 13, 1962).[3] Analysis of long-term precipitation records indicates that wetter and drier cycles lasting several years are common in the region.

b. Runoff and Drainage

The project site includes the existing levees that surround Foster City, narrow bands of land and vegetation or landscaping on either side of the existing levees, and proposed construction staging areas. The existing levees are located adjacent to San Francisco Bay (the bay) to the north and east, low-lying marshy areas of Belmont Slough to the southeast, and Belmont Slough and a drainage channel to the south. The landward side of the Foster City levee system is located adjacent to residential and commercial areas, unimproved lots, parks, muted tidal wetlands, managed lagoon and seasonal wetlands.

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[1] Western Regional Climate Center, 2016a. *General Climate Summary Tables-Temperature, Redwood City, California*. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7339, accessed February 8.

[2] Ibid.

[3] Ibid.

The project site contains pervious surfaces on the sloping sides of the levee system, and an impervious asphalt path on the top of the levee system. On the exterior (bayward) side of the levee system, stormwater that does not infiltrate the subsurface of the project site runs off directly into the bay, into Belmont Slough (which connects to the bay), or into the O'Neill Slough Remnant (which connects to Belmont Slough) on the south side of the city. On the landward side of the existing levees, stormwater that does not infiltrate the subsurface of the existing levees runs off into adjacent landscaped areas, wetlands areas, or streets where it drains through the city's storm drain systems into the Foster City Lagoon. Stormwater that enters the Foster City Lagoon is discharged to the bay through a pumping station located at the northwest end of the lagoon.

Runoff and drainage conditions vary for the staging areas that are proposed for the construction phase of the project, as discussed below. Note that other staging areas could be identified as project details are refined.

One of the proposed staging areas is located in an asphalt-paved parking lot and storage area of the City's corporation yard adjacent to the northwest end of the Foster City Lagoon (staging area 1 on Figure III-1). Runoff from this staging area enters storm drain inlets that drain into the lagoon.

Three of the proposed staging areas are located near the base of the San Mateo Bridge/SR 92 (staging areas 2, 3, and 4 on Figure III-1), including an asphalt-paved access road and adjacent gravel covered area southwest of the bridge, a landscaped and gravel-covered area north of the bridge, and a landscaped picnic area south of the bridge. Runoff from pavement and stormwater that does not infiltrate the permeable surfaces of these staging areas drains through the city's storm drain systems into the Foster City Lagoon.

One of the proposed staging areas is located within the east side of Beach Park Boulevard from south of Bridgeview Park to south of Shorebird Park (staging area 5 on Figure III-1). Runoff from this staging area enters storm drain inlets on Beach Park Boulevard that drain into the Foster City Lagoon.

One staging area would be located in the upland area adjacent to (on the north and west of) the Sea Cloud Phase II sedimentation basin, which is situated between Sea Cloud Park and a segment of the southeast portion of the existing levees (staging area 6 on Figure III-1). Stormwater that does not infiltrate the surface of this staging area runs off across the ground surface into the sedimentation basin or into the Foster City Lagoon, as no stormwater drainage systems exist in this staging area. The majority of the basin is open water during the winter and spring due to rain accumulation, and it typically dries up during the summer. The Sea Cloud Phase II sedimentation basin is a part of a former salt pond and is not hydrologically connected (directly) to San Francisco Bay; however, a spillway located along the northwest portion of the sedimentation basin allows any overflow from the sedimentation basin to enter the Foster City Lagoon.[4]

c. Flooding

The project site is designated as Zone X, "Other Flood Area," on Flood Insurance Rate Maps (FIRMs) published by the Federal Emergency Management Agency (FEMA).[5,6] Zone X designation indicates areas protected from a 1-percent chance of flooding, otherwise known as and referred to in this document as a 100-year flood, including areas protected by an accredited levee system. The City of Foster City completed a Levee Improvement Program in 1993, raising the city's bayside levees to a crest height of approximately 10 feet National Geodetic Vertical Datum of 1929 (NGVD 29).[7,8] FEMA recently updated its analysis of the flood hazards posed by San Francisco Bay through the California Coastal Analysis and Mapping Program (CCAMP). The proposed project is necessary to provide flood protection against the revised flood hazards in accordance with FEMA guidelines and to regain FEMA levee accreditation.[9] For Foster City to regain its Zone X designation while the levee modifications are underway, the City has accepted levee "seclusion mapping."[10]

The Foster City Lagoon is part of the City's stormwater management system; it is used as a retention basin and to buffer the flooding effects of large storms. Two diesel-powered pumps, each capable of moving approximately 125,000–140,000 gallons of water per minute, depending on tidal conditions, lower the water level of the lagoon in anticipation of large storms and/or during the wet weather season.[11] The capacity of each pump is sufficient to prevent flooding during a 100-year storm.[12] The City adjusts the water levels in the lagoon seasonally to provide reserve storage capacity in the event of a storm.[13]

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[4] LSA Associates, Inc., 2000, Public Review Draft, Sea Cloud Park Phase II Site Dredge Material Disposal and Wetlands Restoration Project, Environmental Impact Report, September.

[5] Federal Emergency Management Agency (FEMA), 2012. *Flood Insurance Rate Map (FIRM), San Mateo County, California, Map Number 06081C0186E, 06081C0178E,* effected October 16.

[6] Federal Emergency Management Agency (FEMA), 2015. *Flood Insurance Rate Map (FIRM), San Mateo County, California, Map Number 06081C0159F, 06081C0167F,* revised July 16.

[7] NGVD 29 is a vertical control datum established to measure vertical positions or elevations based on mean sea level measurements circa 1929. For most purposes, NGVD is equivalent to mean sea level.

[8] Ray Towne, 2012. Director of Public Works, Foster City, California. Personal communication with BASELINE Environmental Consulting. August 29.

[9] Schaaf & Wheeler, 2015. City of Foster City Levee Protection Planning Study, updated July.

[10] The seclusion mapping process was developed by FEMA to allow the release of impacted FIRM updates prior to conducting a more detailed analysis on non-accredited levee systems. Levee seclusion mapping will maintain the flood hazard information as depicted on the current effective FIRM with map notes explaining that these flood hazards will be updated when the updated levee analysis and mapping approach is applied.

[11] Ray Towne, 2012, op. cit.

[12] Ibid.

[13] City of Foster City, 2016, Public Works Department, Lagoon System Information. http://www.fostercity.org/publicworks/lagoonandlevee/lagoon-information.cfm, accessed February 9.

The project site is located within a potential dam failure inundation area of the Lower Crystal Springs Dam,[14] which is approximately 6 miles west of the project site. The Lower Crystal Springs Dam—which is owned by the City and County of San Francisco and under the jurisdiction of the California Department of Water Resources, Division of Safety of Dams—has a capacity of 57,910 acre-feet.[15] Dam failure is a low-probability event that can be caused by earthquakes or overflow. Existing dams under state and federal jurisdiction are periodically inspected to ensure that they are adequately maintained and that identified deficiencies are corrected.[16] Regular inspections and required maintenance of the dams substantially reduce the potential for catastrophic failure. The potential for failure of the Lower Crystal Springs Dam was further reduced by a seismic retrofit in May 2012. The seismic retrofit project involved widening the spillway, raising the parapet wall, and replacing the stilling basin with a new larger facility.[17] If the Lower Crystal Springs Dam were to fail, water would flow down San Mateo Creek, spread out over portions of San Mateo, and flow into the Marina Lagoon without reaching Foster City. The City of San Mateo's Marina Lagoon Pump Station at the northern end of the Marina Lagoon is capable of moving 750,000 gallons of water per minute[18] out of the lagoon and into San Francisco Bay.[19] The Foster City Public Works Department estimates that a failure of the Lower Crystal Springs Dam would result in a maximum flood height of about 2 feet at the county fairgrounds in the city of San Mateo, located approximately 1 mile west of the city. This flood height is below the crest height (6 feet) of a levee along the Marina Lagoon in Foster City; it is therefore highly improbable that failure of the Lower Crystal Springs Dam would cause inundation of Foster City.[20]

d. Coastal Hazards

The proximity of the project site to San Francisco Bay and the elevation of the levee (11 to 13 feet NGVD 29) could expose the site to coastal hazards, such as sea level rise, seiche, tsunami, or extreme high tides as further described below.

(1) Sea Level Rise

According to the San Francisco Bay Conservation and Development Commission (BCDC), sea level (including that in San Francisco Bay) is rising and expected to continue rising

[14] City of Foster City, 1995. *General Plan, Chapter 7, Safety Element*, adopted October.

[15] California Department of Water Resources (DWR), 2016. *California Data Exchange Center: Lower Crystal Springs Reservoir*. http://cdec.water.ca.gov/cgi-progs/profile?s=CRY&type=dam, accessed February 9.

[16] California Department of Water Resources (DWR), Division of Safety of Dams, 2012. *Statutes and Regulations Pertaining to Supervision of Dams and Reservoirs*. http://www.water.ca.gov/damsafety/docs/statutes-regulations.pdf, accessed June 14, 2016.

[17] San Francisco Public Utilities Commission (SFPUC), 2016. *Lower Crystal Springs Dam Improvements (WSIP)*. http://216.119.104.145/bids/projectDetail.aspx?prj_id=128, accessed June 14.

[18] Robert H. Born Consulting Engineers, Inc., "Report on Analysis of Foster City Levees," June 15, 1988

[19] City of Foster City, 1995, op. cit.

[20] Ibid.

even with existing efforts to mitigate global warming through reduction of greenhouse gas emissions.[21] Rates of sea level rise vary at specific locations, as local subsidence or uplift affects the relative change in sea level between land masses and the ocean. In the San Francisco Bay Area, the background rate of sea level rise in 1900–2008 was estimated at approximately 0.076 inch per year.[22] According to the Sea Level Rise Committee for the San Francisco Capital Planning Committee of the City and County of San Francisco, likely sea level rise in the San Francisco Bay Area is projected as follows:[23]

- 2000–2030: 6 ± 2 inches, with an unlikely but possible rise of up to 12 inches
- 2000–2050: 11 ± 4 inches, with an unlikely but possible rise of up to 24 inches
- 2000–2100: 36 ± 10 inches, with an unlikely but possible rise of up to 66 inches

(2) Seiche

A seiche is the oscillation of a body of water. Seiches occur most frequently in enclosed or semi-enclosed basins such as lakes, bays, or harbors. They can be triggered in an otherwise still body of water by strong winds, changes in atmospheric pressure, earthquakes, tsunami, or tides. Triggering forces that set off a seiche are most effective if they operate at specific frequencies relative to the size of an enclosed basin. Coastal measurements of sea level often show seiches with amplitudes of a few centimeters and periods of a few minutes due to oscillations of the local harbor, estuary, or bay, superimposed on the normal tidal changes. Seiches are not considered a hazard in San Francisco Bay based on the bay's natural oscillations.[24] Inundation from a seiche that overtops the LCSD would not reach Foster City, as flood waters originating from the LCSD would first enter the Marina Lagoon.[25]

(3) Tsunami

Tsunamis are long period water waves caused by underwater seismic events, volcanic eruptions, or undersea landslides. Tsunamis affecting the San Francisco Bay Area would originate west of the bay in the Pacific Ocean. Areas that are highly susceptible to tsunami inundation tend to be low-lying coastal areas, such as tidal flats, marshlands, and former bay margins that have been artificially filled. Inundation or damage caused by a tsunami

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[21] San Francisco Bay Conservation and Development Commission (SFBCDC), 2011. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.* Approved October 6.

[22] National Research Council of the National Academies, 2012. *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future.* http://www.nap.edu/read/13389/chapter/1, accessed February 8, 2016.

[23] City and County of San Francisco, Sea Level Rise Committee, 2014. *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation.* September 22.

[24] Borrero et. al., 2006. *Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay. Report prepared for: Marine Facilities Division of the California State Lands Commission.* June 8.

[25] City of Foster City, 1995, op. cit.

could disrupt highway traffic in those low-lying areas. A tsunami entering San Francisco Bay through the relatively narrow Golden Gate would tend to dissipate because the energy of the wave spreads out as the bay becomes wider and shallower.[26] The predicted maximum credible tsunami amplitude in the Potrero District of San Francisco (located approximately 14 miles north of the project site) is estimated to be 5.9 feet.[27] The bay becomes much wider and shallower over the distance between the Potrero District of San Francisco and the project site, which would significantly dissipate the energy of the tsunami wave.

The California Emergency Management Agency, California Geological Survey, and Tsunami Research Center at the University of Southern California have produced tsunami inundation maps for areas along the state's coastline, including Foster City.[28] The maps identify areas at risk to inundation from a combination of maximum-considered tsunamis for each area. The tsunami inundation map for the San Mateo Quadrangle identifies tsunami inundation areas along the bayward side of the Foster City levees, with the boundary of the tsunami inundation area generally following the top of the existing levee, indicating that the existing levee would protect properties on the landward side of the levee from tsunami inundation.

(4) Extreme High Tides

Extreme high tides in San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors such as winds, barometric pressure, ocean temperatures, and freshwater runoff. In California, the highest astronomical tides occur in the summer and winter; therefore, extreme high tides are most likely to occur during these seasons. The 100-year stillwater high tide (an extreme high tide with a one percent chance of occurring in any given year) elevation is approximately 10.4 feet referenced to the North American Vertical Datum of 1988 (NAVD 88) along the northern portion of the project site, and approximately 10.2 feet NAVD 88 along the eastern and southern portions of the project site.[29]

e. Surface Water and Groundwater Quality and Beneficial Uses

The quality of surface water and groundwater in the vicinity of the project site is affected by past and current land uses at the site and surrounding area and the composition of geologic materials in the vicinity. The State Water Resources Control Board (State Water Board), through its nine Regional Water Quality Control Boards (RWQCBs), regulates the

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[26] Borrero et. al., 2006, op cit.

[27] Ibid.

[28] California Emergency Management Agency, California Geological Survey, and University of Southern California, 2009. *Tsunami Inundation Map for Emergency Planning, State of California ~ County of San Mateo, San Mateo Quadrangle.* June 15.

[29] Schaaf & Wheeler, 2015. City of Foster City Levee Protection Planning Study. Updated July.

water quality of surface water and groundwater bodies throughout California. In the Bay Area, the San Francisco Bay RWQCB is responsible for implementing the Water Quality Control Plan (Basin Plan).[30] The Basin Plan establishes beneficial water uses for waterways and water bodies within the region and is a master policy document for managing water quality in the region.

San Francisco Bay is listed in the Basin Plan as providing the beneficial uses of industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contract and noncontact recreation, and navigation. Belmont Slough is listed in the Basin Plan as providing the beneficial uses of estuarine habitat, wildlife habitat, preservation of rare and endangered species, fish spawning, and water contact and noncontact recreation. Foster City Lagoon is listed in the Basin Plan as providing the beneficial uses of estuarine habitat, wildlife habitat, and water contact and noncontact recreation.[31]

As described in the Regulatory Framework subsection below, under Section 303(d) of the Clean Water Act (CWA), the states must present the United States Environmental Protection Agency (EPA) with a list of "impaired water bodies," defined as water bodies that do not meet water quality standards, which in some cases results in the development of a total maximum daily load (TMDL). On a broad level, the TMDL process leads to a "pollution budget" designed to restore the health of a polluted body of water. The TMDL process provides a quantitative assessment of water quality problems, contributing sources of pollution, and the pollutant load reductions or control actions needed to restore and protect the beneficial uses of an individual waterbody impaired from loading of a particular pollutant.

The State Water Board has listed lower San Francisco Bay as an impaired water body due to impacts from pollutants that include pesticides (chlordane, dichlorodiphenyltrichloro-ethane, and dieldrin), mercury, dioxins, furans, polychlorinated biphenyls (PCBs), and trash.[32] TMDLs have been approved by the EPA and officially incorporated into the Basin Plan for PCBs and mercury in San Francisco Bay.[33]

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[30] San Francisco Bay Regional Water Quality Control Board, 2015a. *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan).* Incorporating all amendments as of March 20.

[31] Ibid.

[32] State Water Resources Control Board, 2012. *Final 2012 California Integrated Report (Clean Water Act Sction 303(d) List/305(b) Report).* http://www.waterboards.ca.gov/water_issues/programs/tmdl/2012state_ir_reports/category5_report.shtml, accessed June 13, 2016.

[33] San Francisco Bay Regional Water Quality Control Board, 2016. Total Maximum Daily Loads (TMDLs) and the 303(d) List of Impaired Water Bodies, Available at: http://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/TMDLs/, accessed June 13, 2016.

The project site is located in the Santa Clara Valley Groundwater Basin, San Mateo Plain Subbasin. The San Mateo Plain Subbasin is listed in the Basin Plan as providing the beneficial uses of municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply.[34] A geotechnical investigation conducted for Foster City Levees Pedway Improvements found that groundwater at the project site can be encountered at depths of 7–10 feet below ground surface.[35] Groundwater quality in the project area is characterized as slightly alkaline (mean pH of 7.3) with a hardness of 471 milligrams per liter of calcium carbonate, classifying it as "very hard." In some areas, water quality may be impaired due to high concentrations of sodium as a result of tidal influence.[36]

f. Regulatory Framework

Federal, state, and local regulations and plans relevant to hydrology and water quality for the area of the project site are presented below.

(1) Federal

Clean Water Act

The federal CWA of 1972 and subsequent amendments, under the enforcement authority of the EPA, were enacted "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA gave the EPA the authority to implement pollution control programs, such as setting wastewater standards for industry. It also set water quality standards for surface waters and established the National Pollutant Discharge Elimination System (NPDES) program to protect water quality.

CWA Section 303(d) List of Impaired Water Bodies and TMDLs

In accordance with Section 303(d) of the CWA, the states must present the EPA 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 TMDLs or other actions to improve water quality of impaired water bodies. Implementation of this program in the project area is conducted by the San Francisco Bay RWQCB as discussed under State Regulations, below.

CWA Section 402

Under Section 402 of the CWA, discharge of pollutants to navigable waters is prohibited unless the discharge is in compliance with an NPDES permit. Implementation and

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[34] San Francisco Bay Regional Water Quality Control Board, 2015a, op. cit.

[35] ENGEO Inc., 2009. *Geotechnical Report Foster City Levees Pedway Improvements*. August 20.

[36] California Department of Water Resources (DWR), 2004. *California's Groundwater: Santa Clara Valley Groundwater Basin, San Mateo Subbasin, Bulletin 118*. February 27.

enforcement of the NPDES program is conducted through the State Water Board and the nine RWQCBs. Each RWQCB sets standard conditions for the permittees in its region, which includes effluent limitations and monitoring programs. The proposed project would be subject to NPDES permits as described under State Regulations, below.

CWA Section 404

Under Section 404 of the CWA, a permit must be obtained from the United States Army Corps of Engineers (USACE) for work within Waters of the United States, including wetlands. The USACE reviews applications for permits in accordance with Section 404 guidelines, which have been established by the USACE and the EPA, and typically limits and requires mitigation for impacts to Waters of the United States before issuing a permit. The proposed project would require a Section 404 permit based on the proposed construction activities within Waters of the United States.

CWA Section 401

Section 401 of the CWA requires compliance with state water quality standards for actions within state waters. Compliance with the water quality standards required under Section 401 is a condition for issuance of a Section 404 permit. Under Section 401 of the CWA, every applicant for a federal permit or license for any activity that may result in a discharge to a water body must obtain a State Water Quality Certification that the proposed activity will comply with state water quality standards. A State Water Quality Certification would be required for the proposed project because a Section 404 permit would be required, as discussed above. The RWQCBs issue 401 Water Quality Certifications for projects that will take place within their jurisdictions.

(2) State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for the protection of the quality of all Waters of the State of California for use and enjoyment by the people of California. The act also establishes provisions for a statewide program for the control of water quality, recognizing that Waters of the State are increasingly influenced by interbasin water development projects and other statewide considerations, and that factors such as precipitation, topography, population, recreation, agriculture, industry, and economic development vary regionally within the state. The statewide program for water quality control is therefore administered on a local level with statewide oversight. Within this framework, the act authorizes the State Water Board, through the RWQCBs, to oversee the coordination and control of water quality within California.

Stormwater Programs

Stormwater quality is regulated by the NPDES program, established through the federal CWA. The NPDES program objective is to control and reduce pollutant discharges to surface water bodies. Compliance with NPDES permits is mandated by state and federal statutes and regulations. The RWQCBs administer a number of stormwater programs to regulate the discharge of pollutants to surface waters from various sources, including construction site stormwater discharges and municipal stormwater discharges.

Municipal Permit

Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges within Foster City are regulated under the San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008 (the Municipal Regional Permit [MRP]).[37] The MRP is overseen by the RWQCB. The City participates in the San Mateo Countywide Stormwater Pollution Prevention Program, which provides guidance and assistance to municipalities in San Mateo County, assisting them in compliance with the requirements of the MRP.

MRP Provision C.3 addresses post-construction stormwater management requirements for development projects. Provision C.3 of the MRP provides an exclusion for impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or toward the outboard side of levees.[38]

Construction General Permit

Projects disturbing more than 1 acre of land during construction are required to comply with the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (Construction General Permit).[39]

To obtain coverage under the Construction General Permit, the project applicant must provide via electronic submittal, a Notice of Intent (NOI), a Stormwater Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation. The permit also covers linear underground and overhead projects such as pipeline

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[37] San Francisco Bay Regional Water Quality Control Board, 2015b. San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, Order No. R2-2015-0049, NPDES Permit No. CAS612008. November 19.

[38] Ibid.

[39] State Water Resources Control Board Division of Water Quality, 2009. Construction General Permit Fact Sheet. 2009-0009-DWQ amended by 2010-0014-DWQ & 2012-0006-DWQ.

installations. Construction General Permit activities are enforced at a local level by the San Francisco Bay RWQCB.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (i.e., Level 1, Level 2, or Level 3). The project risk level is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The determination of the project risk level would be made by the project applicant when the NOI is filed (and more details of the timing of the construction activity are known).

The performance standard in the Construction General Permit is that dischargers shall minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and best management practices (BMPs) that achieve best available technology (BAT) for treatment of toxic and nonconventional pollutants and best conventional technology (BCT) for treatment of conventional pollutants. A SWPPP must be prepared by a Qualified SWPPP Developer (QSD) that meets the certification requirements in the Construction General Permit (including required professional credentials and/or passage of training courses). The purpose of the SWPPP is to: (1) help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges; and (2) describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Operation of BMPs must be overseen by a Qualified SWPPP Practitioner that meets the requirements outlined in the permit.

The SWPPP must also include a construction site monitoring program. Depending on the project risk level, the monitoring program may include visual observations of site discharges, water quality monitoring of site discharges (pH, turbidity, and nonvisible pollutants, if applicable), and receiving water monitoring (pH, turbidity, suspended sediment concentration, and bioassessment).

(3) Local Regulatory Considerations

Applicable local regulations related to hydrology and water quality are described below.

Foster City General Plan

The following goals, policies, and programs from the Foster City General Plan Safety Element[40] related to hydrology and water quality pertain to the proposed project:

[40] City of Foster City, 1995,op. cit.

Safety Goal S-B Protect From Flood Waters. Protect the community from unreasonable risk to life and property caused by flood hazards.

Policy S-4 Flood Protection. The City will maintain the City's levees and lagoon system for flood protection.

Policy S-5 Flood Plain Regulations. The City will control development to minimize risks to person and property within any special flood hazards area through flood plain regulations.

Program S-*G Maintain Levees and Lagoon for Flood Protection.* The City (Public Works) will maintain the City's levees and lagoon for flood protection pursuant to the "Operation and Maintenance Manual, Foster City Levees and Pump Station" and the "Lagoon Management Plan".

Program S-H Flood Plain Regulations. The City (Community Development Department) will evaluate any proposed development with in special flood hazard areas for conformance with the City's flood plain regulations as contained in Chapter 15.36 of the Foster City Municipal Code.

Foster City Municipal Code

The following regulation from the Foster City Municipal Code related to hydrology and water quality pertains to the proposed project:

Chapter 8.04 - Waste Material Control. This chapter provides for the regulation and control of the quantity and quality of discharges to the storm sewer system in order to prevent those discharges from adversely affecting the system and the quality of the receiving waters. In addition, this chapter is intended to respond to regulations adopted as part of the Federal Clean Water Act and the Water Quality Act, as well as other federal and/or state regulations, which require the adoption of plans and programs for stormwater management.

2. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to hydrology and water quality that could result from implementation of the proposed project. Included are: (1) the criteria of significance (consistent with Appendix G of the CEQA Guidelines), which establish the thresholds for determining whether an impact is significant; and (2) the hydrology and water quality impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

The project would have a significant effect on hydrology or water quality if it would:

- Violate any water quality standards or waste discharge requirements.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site.

- 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.

- Otherwise substantially degrade water quality.

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows.

- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam.

- Inundation by seiche, tsunami, or mudflow.

b. Less-Than-Significant Hydrology and Water Quality Impacts

Implementation of the proposed project would result in the less-than-significant impacts described below. Because these impacts would not exceed the significance thresholds described above, no mitigation measures would be necessary.

(1) Groundwater Supplies

With the exception of maintaining a dry work area while constructing the footings for the sections of conventional floodwall,[41] dewatering is not planned during construction of

[41] This would require only temporary pumping of water from shallow excavations and would not be expected to affect regional groundwater levels.

proposed levee and floodwall improvements (2050 Sea Level Rise and 2100 Sea Level Rise), and no local groundwater supplies would be used during the operational phase. The project would not interfere with groundwater recharge because the project site is underlain by Bay Mud. Bay Mud consists of clay deposits through which infiltration is minimal. As a result, the slight increase of impervious surfaces due to construction of the flood wall and widened paved trail would not interfere with groundwater recharge.

(2) Alter Drainage Patterns Resulting in Erosion/Siltation

The proposed project would not modify streams or rivers or substantially alter the existing drainage patterns of the project site under either of the scenarios (2050 Sea Level Rise and 2100 Sea Level Rise). Stormwater runoff from the existing paved pedestrian path on top of the levee system currently flows to landscaped areas or permeable areas protected from erosion (e.g., protected by rip rap) on the slopes of the levee. A raised berm (and in some locations, a concrete flood wall) is present along the bayward side of much of the existing pedestrian path, and runoff in these areas is directed toward the landward side of the levee. Stormwater that does not infiltrate the landward slopes of the levee runs off into adjacent landscaped areas or into city streets where it enters the city's storm drain system. Runoff that does not infiltrate the bayward slopes of the levee runs off into the bay or into adjacent low-lying permeable areas, including open space and wetlands areas.

Following construction of the proposed project, the slopes of the levee would be planted with landscaping to prevent erosion, and slopes along the bayward side of the levee would be protected from erosion by rip-rap where necessary. Stormwater runoff from the new pedestrian path and the top of the flood wall would flow into adjacent landscaped areas and permeable areas protected from erosion, similar to the existing drainage condition. The project would therefore have a less-than-significant impact on erosion or siltation associated with changing drainage patterns.

(3) Alter Drainage Patterns Resulting in Flooding

As discussed above, the proposed project would not modify streams or rivers, or substantially alter the existing drainage patterns of the project site under either of the scenarios (2050 Sea Level Rise and 2100 Sea Level Rise). The proposed project would result in an increase in impervious surface due to installation of a floodwall; however, runoff from the floodwall would be directed to adjacent landscaped areas and permeable areas protected from erosion. The project would therefore have a less-than-significant impact on flooding associated with changing drainage patterns.

(4) Contribute Polluted Runoff or Exceed Storm Drain System Capacity

As discussed above, the proposed project would result in an increase in impervious surface due to installation of a floodwall and widened paved trail; however, runoff from the floodwall would be directed to adjacent landscaped areas and permeable areas protected from erosion under either of the scenarios (2050 Sea Level Rise and 2100 Sea Level Rise). Further, the proposed project would not substantially increase sources of polluted runoff, as the proposed use of the project site is to remain a pedestrian path and this type of land use is not a source of substantial pollution. The proposed project would therefore have a less-than-significant impact on the conveyance capacity of the city's storm drain system and in contributing to additional sources of polluted runoff.

(5) Place Housing in a Flood Hazard Area

The proposed project does not include construction of housing; therefore, this is not an impact.

(6) Place Structures in a Flood Hazard Area

In July 2014, FEMA completed the Central San Francisco Bay Coastal Flood Hazard Study as part of the California Coastal Analysis and Mapping Program. The Coastal Flood Hazard Study indicated that the Foster City levee is freeboard deficient and will not regain accreditation unless improvements are made to raise the existing levee height. If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San Mateo will be located within a FEMA-designated 100-year Special Flood Hazard Area (based on the to-be-revised FIRMs) due to the risks associated with levee overtopping. Under both scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), the proposed project would improve the existing levee system with the objective of obtaining FEMA accreditation by providing protection from the 100-year flood in conformance with the standards proscribed in Title 44 of the Code of Federal Regulations (44 CFR) Section § 65.10. This would involve construction of structures (flood walls, raised levees, and new pedestrian path) within a flood hazard area. Once completed, the flood walls and raised levee structures would impede potential flood flows from coastal hazards, including sea level rise (for the 2050 and 2100 Sea Level Rise scenarios), tsunamis, extreme high tides, and storm surges from overtopping the levee and flooding the new pedestrian path and areas of the city. This impeding of coastal flood flows would be a beneficial effect for the new pedestrian path and for the city. The proposed project would not impede or redirect flood flows within stormwater floodways (e.g., creeks, streams, sloughs, or other stormwater drainage channels). The proposed project would therefore have a less-than-significant impact related to flooding associated with placement of structures in flood hazard zones and impeding or redirecting flood flows.

(7) Dam and Levee Failure

As discussed in the earlier section above, if the Lower Crystal Springs Dam should fail, water would flow down San Mateo Creek, spread out over portions of San Mateo, and flow into the Marina Lagoon without reaching Foster City.[42] The potential for dam failure to inundate the project site is therefore less than significant under both the project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise).

Levees are evaluated by FEMA as part of flood risk studies performed under the National Flood Insurance Program (NFIP). Levees that meet the design, operation, and maintenance criteria outlined in 44 CFR Section § 65.10 are accredited by FEMA as providing protection from a 100-year flood when determining risk zones for NFIP maps. Therefore, any potential impacts related to failure of the existing Foster City levee system would be considered less than significant.

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), the proposed levee improvement would be designed according to the criteria outlined in 44 CFR § 65.10, which includes criteria for freeboard design, closure designs for levee openings, embankment protection, embankment and foundation stability analysis, settlement analysis, and interior drainage analysis. The proposed levee improvement designs would then be submitted to FEMA in a Conditional Letter of Map Revision (CLOMR) application for review and comment, and the levee would not be constructed until after FEMA issues the Conditional Letter indicating that, if built as proposed, the improved levee system would meet the standards for accreditation by FEMA. Following construction of the levee improvements according to the FEMA approved design, as-built drawings certified by a Professional Engineer would be submitted to FEMA for review as part of the application for a Letter of Map Revision (LOMR). If the levee is subsequently accredited by FEMA, they would issue a LOMR showing Foster City and those areas in San Mateo protected by the Foster City Levee within a Shaded X moderate-risk flood hazard zone. FEMA may also elect to revise the FIRM to reflect this change in levee accreditation status and acknowledge the elimination of the seclusion zone.

As described in 44 CFR § 65.10, for levee systems to continue being recognized by FEMA as providing protection from a 100-year flood, the levees must be regularly maintained in accordance with an officially adopted maintenance plan; this plan documents the formal procedure for ensuring that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. All maintenance activities must be under the jurisdiction of a federal or state agency, an agency created by federal or state law, or an agency of a community participating in the NFIP that must assume ultimate responsibility for maintenance.

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[42] City of Foster City, 1995, op. cit.

An operation and maintenance (O&M) plan for the improved levee system would be prepared in accordance with the requirements of 44 CFR § 65.10, and would be submitted to FEMA for review and approval. O&M activities would be implemented as required by the O&M plan to ensure that the levee remains accredited by FEMA. The City would act as the jurisdictional agency overseeing and assuming ultimate responsibility for the maintenance activities. The condition of the existing levee at the project site is inspected periodically (generally, quarterly) by the City of Foster City, and this program would continue if the project is implemented.

Because the levee would be designed, constructed, and maintained in accordance with FEMA requirements, the risk of levee failure during the operational phase of the proposed project would be less than significant.

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), construction of sheet pile floodwalls, which is the preferred levee improvement type along the majority of the levee system, would not compromise the level of flood protection during construction provided by the existing levee, as the sheet piles would be driven through the top of the existing levee (i.e., no excavation or breach of the existing levee would occur during construction).

The other two improvement types (earthen levee and conventional floodwall) could temporarily reduce the level of flood protection provided by the existing levee because these improvement types would require excavation of material from the levee crest.

Construction of earthen levees (refer to Figures III-4 and III-5 for proposed locations) would require that the top of the existing levee be excavated and reduced in elevation by a relatively small amount and then conditioned to accept new fill. Some levee freeboard would be compromised. However, the top of levee elevation would remain above the 100-year flood tide level, and the excavation of existing levee materials, conditioning, and placement of new fill would be completed within a short period of time. The construction timing would be coordinated to avoid stormy weather and atmospheric conditions when extreme high tides could occur. Therefore, there would be negligible risk of levee overtopping during construction of earthen levee improvements.

Construction of the conventional floodwall improvement type (refer to Figures III-4 and III-5 for proposed locations) would require substantial excavation into the existing levee, which would temporarily compromise the existing level of flood protection provided by the levee. However, installation of temporary sheet piling on the exterior of the levee system during construction of conventional floodwalls, as proposed by the project, would ensure that the level of flood protection is not compromised. Due to limited space and limited vertical clearance under the San Mateo Bridge/SR 92, installation of sheet piling needed to protect the construction site from inundation during periods of high tide or wind wave activity would be difficult in this area. The high tide is approximately 5 feet below the existing top of levee in this area. Therefore, excavations up to 5 feet deep for the conventional floodwall foundation would be subject to inundation in only the more extreme tidal or wind wave events. Temporary flood barriers would be installed adjacent to the Bay Trail outside of the bridge footprint to maintain the level of flood protection to property within Foster City. However, these temporary flood barriers would not protect the construction site beneath the San Mateo Bridge/SR 92 from flooding during extreme high tides. Temporary flooding of the construction site is considered a less-than-significant impact because it is a low-probability event and construction crews would likely be able to anticipate the flooding and move equipment and supplies to high ground before the flooding occurred.

(8) Degrade Water Quality – Project Operation

Implementation of the proposed project under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) would result in the creation of new impervious surfaces along the levee alignment. The Bay Trail would be replaced in-kind or improved; the new trail would be 14–16 feet wide (10 feet paved with a 2-foot shoulder on each side and an additional 1 foot of shoulder adjacent to vertical walls where feasible). In addition, the sheet pile floodwall and conventional floodwall improvement types would each have a flat horizontal impervious surface (the top of the floodwall) approximately 1–2 feet wide.

The combination of the improved and widened trail and the floodwall cap would exceed the minimum threshold of 10,000 square feet of new or replaced impervious cover under MRP provision C.3.b.ii, which could trigger the requirement that stormwater runoff from the new structure be treated prior to discharge. However, a specific exclusion to this requirement includes "impervious trails built to direct stormwater runoff to adjacent vegetated areas, or other non-erodible permeable areas, preferably away from creeks or towards the outboard side of levees." (C.3.b.ii.4.(d)). Because the trail proposed by the project would satisfy the requirements of this exclusion, post-construction water quality treatment of trail runoff would not be required. Similarly, the new impermeable surface that would result from construction of the floodwall would also be exempt from MRP Provision C.3 requirements because stormwater runoff from the flood wall would be directed to adjacent vegetated areas and permeable surfaces that would be protected from erosion.[43] Based on this, and because the trail and floodwall cap would not represent an important pollutant loading source, the potential for degradation of runoff water quality during the operation period would be less than significant.

[43] Dale Bowyer, 2016. E-mail correspondence between BASELINE and Dale Bowyer of the RWQCB. March 14.

c. Significant Hydrology and Water Quality Impacts

Implementation of the proposed project could result in a significant impact related to water quality, as described below.

Impact HYD-1: Construction of the proposed project could result in degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay.. (S)

(1) Degrade Water Quality – Project Construction

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), construction activities on the project site would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. If not managed properly, the runoff could cause increased sedimentation and turbidity in surface waters outside of the project site, resulting in degradation of water quality.

The potential for chemical releases is present at most construction sites. Once released, substances such as fuels, oils, paints, and solvents could be transported to nearby surface waterways in stormwater runoff, wash water, and dust control water, potentially reducing the quality of the receiving waters.

Not only could construction activities result in releases of contaminants (e.g., fuels and lubricants for construction equipment) to the ground surface of the work areas along the levee and at the staging areas (which could be transported to receiving waters in stormwater runoff), but the project could release contaminants directly into San Francisco Bay due to the close proximity of the bay to some of the work areas. Construction activities adjacent to the bay and Belmont Slough would also cause disturbance of soil or sediments along the banks of the bay and Belmont Slough that could result in increased turbidity in surface waters. This is a potentially significant impact.

Mitigation Measure HYD-1a: The following measures shall be implemented to reduce the risk of spill/releases and disturbed soils from impacting water quality in nearby surface waters during construction activities:

- The contractor(s) shall designate storage areas suitable for material delivery, storage, and waste collection. These locations must be as far away from catch basins, gutters, drainage courses, and water bodies as possible. All hazardous materials and wastes used or generated during project site development activities shall be labeled and stored in accordance with applicable local, state, and federal regulations. In addition, an accurate up-to-date inventory, including Safety Data

Sheets (SDSs), shall be maintained on-site to assist emergency response personnel in the event of a hazardous materials incident.

- All maintenance and fueling of vehicles and equipment shall be performed in a designated bermed area, or over a drip pan that will not allow runoff of spills. Vehicles and equipment shall be regularly checked and have leaks repaired promptly at an off-site location. Secondary containment shall be used to catch leaks or spills any time vehicle or equipment fluids are dispensed, changed, or poured.
- Construction Best Management Practices (BMPs) related to stormwater pollution prevention shall be included on the construction plans.
- The contractor shall implement a Storm Water Pollution Prevention Plan (SWPPP) prepared by a Qualified SWPPP Developer (QSD) and designed to reduce potential adverse impacts to surface water quality during the construction period. The SWPPP shall include the minimum BMPs required for the identified risk level. BMP implementation shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction. The SWPPP shall be designed to address the following objectives:

  1) All pollutants and their sources, including sources of sediment associated with construction activity are controlled.
  2) Where not otherwise required to be under a Regional Water Quality Control Board (RWQCB) permit, all non-stormwater discharges are identified and either eliminated, controlled, or treated.
  3) Site BMPs are effective and result in the reduction or elimination of pollutants in stormwater discharges and authorized non-stormwater discharges from construction activity.
  4) Stabilization BMPs installed to reduce or eliminate pollutants and erosion of exposed soil after construction are completed, which may include but would not be limited to: hydroseeding, planting of vegetation, installation of jute/burlap netting, and installation of swales in graded areas.
  5) BMPs shall be designed to mitigate construction-related pollutants and at a minimum, include the following:

     a. Practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with stormwater. The SWPPP shall specify properly-designed centralized storage areas that keep these materials out of the rain.

b. Practices to reduce erosion of exposed soil which may include, but are not limited to: soil stabilization controls, watering for dust control, perimeter silt fences, placement of hay bales, and sediment basins.

c. If grading must be conducted during the rainy season, the primary BMPs selected shall focus on erosion control (i.e., keeping sediment on the site). End-of-pipe sediment control measures (e.g., basins and traps) shall be used only as secondary measures. Ingress and egress from the construction site shall be carefully controlled to minimize off-site tracking of sediment. Vehicle and equipment wash-down facilities shall be designed to be accessible and functional during both dry and wet conditions.

6) The SWPPP shall specify a monitoring program to be implemented by the construction site supervisor, and shall include both dry and wet weather inspections. Monitoring shall be required during the construction period for pollutants that may be present in the runoff that are "not visually detectable in runoff."

- Site supervisors shall conduct regular tailgate meetings to discuss pollution prevention. The frequency of the meetings and required personnel attendance list shall be specified in the SWPPP.
- A Qualified SWPPP Practitioner (QSP), hired by the City of Foster City Public Works Department and/or the project team, shall be responsible for implementing BMPs at the site (a qualified professional that has the required professional credentials and has passed specific training courses in accordance with the Construction General Permit). The QSP shall also be responsible for performing all required monitoring, and BMP inspection, maintenance and repair activities. The QSP shall retain an independent monitor to conduct weekly inspections and provide written monthly reports to the City of Foster City Public Works Department and/or the project team to ensure compliance with the SWPPP.

Mitigation Measure HYD-1b: The City of Foster City Public Works Department and/or the project team shall require the project contractor(s) to obtain applicable resource agency permits and approvals and comply with permit requirements to prevent impacts to water quality and demonstrate that water quality standards and/or waste discharge requirements are not violated. Permit requirements and avoidance measures that may be required by the US Army Corps of Engineers and/or the RWQCB may include, but not be limited to the following:

- Installing physical barriers (e.g., silt curtains) to prevent potential localized impacts to water quality (e.g., increase in turbidity) from spreading to surrounding surface waters.

- Performing water quality monitoring, including sampling and analysis for turbidity and total suspended solids.

At the direction of the applicable resource agency, the results of the water quality monitoring shall be compared to established performance standards. If water quality monitoring indicates that performance standards are not being achieved, additional avoidance measures (e.g., installation of additional silt curtains) shall be implemented until water quality monitoring indicates that performance standards are being achieved, which would mitigate the potential impacts to water quality to a less-than-significant level.

Compliance with the Construction General Permit and implementation of **Mitigation Measures HYD-1a** and **HYD-1b** would ensure that potential impacts to water quality would be less than significant. (LTS)

d. Cumulative Water Quality Impacts

The geographic area of concern for cumulative hydrology and water quality impacts is the city of Foster City and the surrounding water bodies, primarily San Francisco Bay. Even though the State Water Board has not listed lower San Francisco Bay (the receiving water adjacent to the project site), as impaired for sediment, it is recognized that erosion and sediment discharge can have adverse effects on water quality. Even if there were the potential for significant cumulative impacts related to project construction period erosion and sedimentation in the bay, the project’s contribution would be reduced to less than cumulatively considerable through implementation of **Mitigation Measure HYD-1a** and **HYD-1b**.

Stormwater discharges are affected by urban pollutants that contribute to the degradation of water quality in surface waters near the project site, including the Foster City Lagoon, Belmont Slough, and San Francisco Bay. Urban pollutants in stormwater include petroleum hydrocarbons, sediments, metals, pesticides, and trash. Past, current, and reasonably foreseeable projects in the vicinity of the project site could result in cumulative impacts associated with stormwater discharges, similar to the potential impacts from construction of the proposed project. To adequately address cumulative water quality impacts, stormwater regulations have become progressively more stringent since the passage of the federal CWA, and current NPDES permits now require new development and redevelopment projects to manage and treat all significant sources of stormwater pollutants and reduce runoff. NPDES permit requirements apply to the cumulative projects as well as the proposed project. As such, a reduction in runoff and overall pollutant loads in stormwater in the vicinity of the project site is anticipated over time, thereby reducing cumulative impacts. Although overall water quality in the Foster City Lagoon, Belmont

Slough, and San Francisco Bay is anticipated to improve over time, the Marina Lagoon and San Francisco Bay are currently designated as “impaired” by the State Water Board.

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), stormwater drainage generated by the project site would not cause an increase in the flow rate or volume of stormwater being discharged to the city’s storm drain system; therefore, the proposed project would not have a cumulatively considerable impact on flooding, downstream erosion, or exceedance of storm drainage capacity.

Under both project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise), the proposed project would not use, handle, store, or generate compounds or constituents contributing to the impaired status of San Francisco Bay, with the exception that trash would be generated during construction and operation of the proposed project. Implementation of **Mitigation Measure HYD-1a**, which would ensure appropriate waste collection practices during construction, would ensure that trash generated during construction is not released into the environment. Generation and handling of trash during operation of the project would not change from the current condition, which includes appropriate trash collection facilities and disposal procedures to prevent the release of trash into the environment. The proposed project would therefore not have cumulatively considerable operation- or construction-related impacts on water quality.

I. LAND USE

This section describes existing land uses within and in the vicinity of the project site, and evaluates the project's potential land use impacts.

1. Environmental Setting

This subsection discusses the regional and local land use setting and provides specific information about the project site and vicinity. Land uses within and adjacent to the project site are generally identified in the aerial photo presented in Figure V.I-1. The project site's General Plan land use designations and zoning designations are identified and discussed in *Chapter IV, Planning Policy*.

a. Regional Setting

The project site is located on the San Francisco Peninsula within Foster City, in San Mateo County, as shown in Figure III-1. Foster City is approximately 15 miles southeast of San Francisco and approximately 30 miles northwest of San Jose; it is bordered by San Francisco Bay to the north and east, the cities of Belmont and Redwood City to the south, and the city of San Mateo to the west. Major transportation corridors in the area include U.S. Highway (US) 101 and State Route (SR) 92.

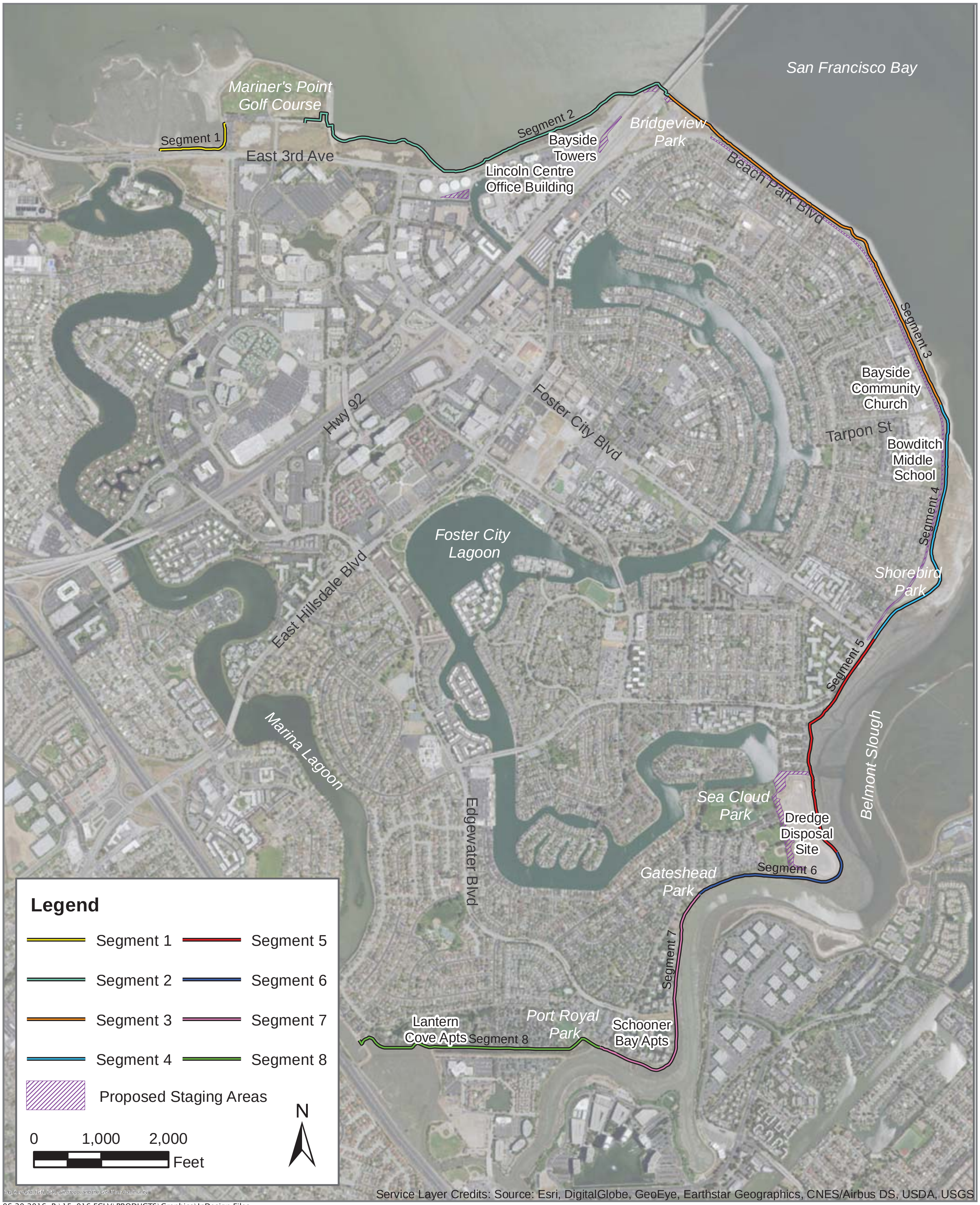
b. Local Setting

Foster City is a "Planned Community," constructed and implemented on the basis of an organized program of development. The city was originally designed in the 1960s as a suburban community with a clear community center and an industrial base to support required services. It was constructed on reclaimed marshlands devoted to dairy farming and evaporation ponds. Development of the city has been dictated by the natural, mainly water-oriented constraints of the filled marshlands.

The project site consists of approximately 8 miles of existing levees, narrow bands of land and vegetation or landscaping on either side of the existing levees, and six proposed construction staging areas. The levee is divided into eight distinct segments to provide site-specific detail.

c. Existing Conditions and Land Uses on the Project Site and in its Vicinity

This subsection describes the existing conditions along the length of the project site, as well as the existing zoning and General Plan land use designations in its vicinity. Zoning designations and land use classification are described in more detail in *Chapter IV, Planning Policy.*



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Source: Schaaf & Wheeler, Urban Planning Partners, 2016
Note: The location of staging areas are preliminary and may change.

Figure V.I-1
Foster City Levee Protection Planning and Improvements Project EIR
Existing Land Uses in Project Vicinity

The project site consists of approximately 43,000 feet (about 8 miles) of existing levees that surround Foster City along the bayfront with a slight deviation from the existing levee system footprint, and six construction staging areas. The project site begins at the San Mateo city limit in the north (adjacent to East 3rd Avenue), extends parallel to Beach Park Boulevard and Belmont Slough to the east and southeast, and ends adjacent to US 101 in the south at the San Mateo/Belmont city limit.

The existing levee ranges in height from 11 to 13 feet above the North American Vertical Datum of 1988. The Bay Trail, a multi-purpose recreational trail, runs either on top of or immediately adjacent to the levee, and is generally paved throughout the entire levee segment.

As discussed in *Chapter IV, Planning Policy*, the existing General Plan designations for the project site, including staging areas, are Open Space, Parks and Recreation, Light Industrial, and Waterfront Commercial, Research/Office Park, Single Family Residential, and Townhouse Residential. The existing zoning designations for the site include: Open Space and Conservation District (OSC); Light Industrial/Planned Development District (M-1/PD); Commercial Mix/Planned Development District (C-M/PD); and Open Space and Conservation/Aquatic Development Combining District (OSC/W).

(1) Segments 1 and 2: San Mateo City Limit to San Mateo Bridge/SR 92

The first 0.2 mile of segment 1 is bordered by fenced, undeveloped wetlands on the bayside and East 3rd Avenue on the landward side. The levee then heads north toward San Francisco Bay; this north-south segment is approximately 400 feet long. The next, approximately 0.6-mile-long portion of the levee is adjacent to Mariners Point Golf Center and is not part of the proposed project.

The first 0.4 mile of segment 2 is bordered by the open water of San Francisco Bay on the bayside and disturbed upland vegetation on the landward side. Where segment 2 meets East 3rd Avenue, the next 0.7-mile segment is bordered by San Francisco Bay on the bayside and East 3rd Avenue on the landward side with wetlands, including the City's Lagoon Outfall Structure, and industrial and office-related uses located just beyond. Several large office buildings are located approximately 200 feet south of the levee as the levee approaches San Mateo Bridge/SR 92, including the six-story Lincoln Centre office building at 100 Lincoln Centre Drive, and the Bayside Towers office buildings and associated parking lot at 4000/4100 East 3rd Avenue. A 0.6-acre staging area is located in a parking lot and storage area of the City's Corporation Yard behind three water towers, southeast of the intersection of East 3rd Avenue and Foster City Boulevard. This segment ends just west of the San Mateo Bridge/SR 92. At this location, there would be two staging areas: (1) a 0.8-acre staging area in a dirt lot to the west of SR 92, approximately 0.2 mile southwest of the San Mateo Bridge/SR 92; and (2) a 0.3-acre staging area to the west of the bridge in a dirt lot.

Office building at 100 Lincoln Centre Drive

Bayside Towers and associated parking lot at 4000/4100 East 3rd Avenue

(2) Segment 3: San Mateo Bridge/SR 92 to Beach Park Boulevard/Tarpon Street

Segment 3 begins on the east side of the San Mateo Bridge/SR 92. At this location, a 0.2-acre staging area is proposed to the east of the bridge adjacent to Bridgeview Park, an open space area with picnic benches. Another 5.4-acre linear staging area would be proposed adjacent to Beach Park Boulevard for the majority of segment 3 (for a total of 1.7 miles). The levee runs almost parallel to Beach Park Boulevard for the first 0.2 mile of segment 3, and is bordered by the open water of San Francisco Bay on the bayside and Bridgeview Park on the landward side. The next approximately 0.6-mile portion of segment 3 is characterized by mudflats and the open water of San Francisco Bay. The levee trail has a strip of vegetation separating the levee and Bay Trail from the road. Single-family residences are located on the landward side of Beach Park Boulevard. Several benches and picnic tables are located just bayside of the levee, directly adjacent to San Francisco Bay. The levee continues for another 0.6 mile; about halfway into this segment, a small section of land and wetlands juts out approximately 250 feet into the bay at the Foster City Shell Bar. This segment of the levee does not have any riprap except for a few brief stretches. Along this segment, on Beach Park Boulevard, the land uses are more mixed and consist of single-family residences, townhouses, apartment buildings, and commercial uses. Bayside Community Church and Bowditch Middle School are located at the southern end of this segment.

Bridgeview Park, with the San Mateo Bridge/SR 92 in the background

View toward the Bay Trail, Bridgeview Park, and residences

(3) Segment 4: Beach Park Boulevard/Tarpoon Street to Foster City Boulevard

Along this segment, the levee continues running parallel to Beach Park Boulevard, with a field of vegetation on the bayside and single-family residences on the landward side. The 5.4-acre linear staging area along Beach Park Boulevard would continue for all of segment 4. The deviation area along Beach Park Boulevard would begin near the intersection of Swordfish Street and end near the northern edge of Shorebird Park. Along this stretch, the road would lose one lane of parking on the bayside of Beach Park Boulevard. The levee then briefly cuts east, away from Beach Park Boulevard, before cutting west and rejoining it. This 0.25-mile portion is bordered by a field of vegetation on the bayside side and Shorebird Park, an open space area with picnic benches, on the landward sides of the levee.

Shorebird Park

Field of vegetation on the bayside of the levee, near Shorebird Park

(4) Segment 5: Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park/Dredge Disposal Site

The next 0.3 mile of the levee is bordered by wetlands along Belmont Slough on the bayside and a mix of single-family and multiple-family housing on the landward side. Multiple large transmission towers are located within the wetlands along this segment. At this point, the levee diverges from Beach Park Boulevard. The next 0.3 mile of the levee features wetlands on the bayside of the levee and two groups of townhouses on the landward side. The townhouses are less than 100 feet from the levee. The levee segment then continues alongside townhouses, but is separated by a wide median as well as Wheel House Lane; the townhouses end at the end of Wheel House Lane, and the next 0.45 mile of the levee features a fenced vacant field on the landward side (adjacent to Sea Cloud Park) with wetlands on the bayside. A 3.8-acre staging area along the perimeter of the Foster City Lagoon Dredge Disposal Site and adjacent to the City's Lagoon Intake Structure is proposed for the project.

Townhouses along Wheel House Lane

Looking north along the Bay Trail from a viewpoint adjacent to Wheel House Lane

(5) Segment 6: Belmont Slough to Gateshead Park

The next 0.25-mile portion of the levee runs alongside the wetlands of Belmont Slough on the bayside; on the landward side, it passes a sports field associated with Sea Cloud Park and an additional small park-like area. This segment then runs along single-family residences, although the levee is mainly shielded from view by a perimeter of trees and bushes. The next 0.75 mile of the levee is bordered by Belmont Slough on the bayside and single-family and multiple-family residences on the landward side. Occasional trees screen some of the residences from the levee; however, other residences are located directly adjacent to and in full view of the levee. This segment ends at Gateshead Park.

Gateshead Park

View from levee near Timberhead Lane across Belmont Slough to Oracle offices

(6) Segment 7: Gateshead Park to Port Royal Park

Segment 7 begins at Gateshead Park, a small open space with benches, and a small playground with tennis courts is located near the intersection of Leeward Lane and Baffin Street on the landward side. Further along this segment on the landward side is Schooner Bay Apartment Homes, a large apartment complex.

Schooner Bay Apartment Homes, with levee and Bay Trail in foreground

Schooner Bay Apartment Homes

(7) Segment 8: Port Royal Park to Belmont City Limit

The next 0.1 mile of the levee traverses along wetlands on the bayside and single-family and multiple-family residences, as well as the Port Royal Park and soccer field, on the landward side. The next 0.2 mile of the levee is the only section with a floodwall; it is located on the bayside of the Bay Trail. On the bayside of the levee is Belmont Slough; the landward side consists of multiple-family residences. On the landward side are townhouses that are separated from the levee/Bay Trail by a fence; these townhouses are immediately adjacent to the levee and are the nearest residences to the levee along the entire 8-mile system. The next 0.35-mile portion of the levee features O'Neill Slough on the bayside and the Lantern Cove apartment complex on the landward side; the nearest residences here are approximately 50–75 feet north of the levee.

Port Royal Park

Near the southwestern end of the levee

2. Regulatory Framework

The applicable goals, policies, programs, and regulations of the Foster City General Plan, the Foster City Zoning Ordinance, the San Francisco Bay Plan (Bay Plan), the San Mateo County Comprehensive Airport Land Use Plan, Plan Bay Area, and relevant regional land use plans are discussed in *Chapter IV, Planning Policy*.

3. Impacts and Mitigation Measures

This subsection analyzes environmental impacts related to land use that could result from implementation of the proposed project. Included are (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the land use impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts. Impacts are divided into separate categories based on their significance according to the following criteria: less-than-significant impacts (which do not require mitigation) and significant impacts (which do require mitigation).

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on air quality if it were to:

- Physically divide an established community;
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance), adopted for the purposed of avoiding or mitigating an environmental effect; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

b. Less-than-Significant Land Use Impacts

All land use impacts associated with the proposed project would be less-than-significant and are discussed below.

(1) Divide an Established Community

The levee is located between mainland Foster City and San Francisco Bay with its associated wetlands. The levee also functions as a multi-purpose recreational trail (Bay Trail) that provides residents with access to the bay. The levee height increases would range from 0.5–7 feet under the 2050 Sea Level Rise scenario and 4–10.5 feet under the 2100 Sea Level Rise scenario. The increases in height would not constitute an erection of a barrier that could impede resident access to the bay because the levee would continue to function as a recreational trail after construction. All existing access points to the Bay Trail from mainland Foster City would be maintained. Land uses on the bayside of the levee consist of San Francisco Bay, wetlands, and sensitive habitat, and are generally inaccessible to the public. There are a few spur trails that branch off from the Bay Trail and travel through the wetlands on the bayside of the trail; access to these trails would also be maintained after completion of the project.

The levee improvements would occur within the existing levee alignment and the proposed activities would not create a physical barrier within an established community. Therefore, no impacts related to the physical division of communities would result from implementation of the proposed project.

(2) Conflict with Land Use Plans or Policies

Levee improvements would mainly occur within the existing levee footprint. Although the levee would be widened in certain areas, this would only occur where there is sufficient right-of-way without encroaching upon the public right-of-way or adjacent private property. Levee improvements would increase the levee's resistance to erosion, provide better overall levee stability, and provide additional flood protection for adjacent land uses.

Additional space would be needed during construction of the proposed project to access the project site and stockpile materials. The six staging areas used for this purpose could experience temporary changes to their land use; however, as construction progresses along the levee, staging areas no longer needed would be returned to their prior use.

As discussed in *Chapter IV, Planning Policy*, levee improvements under both the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios would not conflict with any applicable plans, policies, or regulations adopted for the purpose of avoiding or mitigating environmental impacts.

Habitat Conservation Plans

There are no Habitat Conservation Plans or Natural Area Community Plans encompassing the site or vicinity; therefore, no conflicts with these types of plans are anticipated.

c. Significant Land Use Impacts and Mitigation Measures

Implementation of the proposed project would not result in any significant land use impacts; all impacts would be less than significant, as discussed above.

d. Cumulative Land Use Impacts

Under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios, the project would consist of improving the existing levee system footprint with the exception of a deviation along Beach Park Boulevard between Swordfish Street and the northern edge of Shorebird Park. Similarly, under both scenarios, the Bay Trail would be replaced in-kind or improved, and the new trail would be 14–16 feet wide (10 feet paved with a 2-foot shoulder on each side and an additional 1 foot of shoulder adjacent to vertical walls where feasible). The project would therefore not change the levee's current use. As such, operation of the proposed project would not result in cumulative land use impacts in conjunction with other planned development. Projects included in the cumulative analysis would all be required to conform to General Plan policies (including those for jurisdictions outside Foster City, as applicable) and to applicable design guidelines that are intended to minimize land use conflicts. The proposed project would not result in land use changes but would rather improve an existing levee system to account for changing conditions.

J. NOISE AND VIBRATION

This section evaluates potential noise and vibration impacts associated with the proposed project. The Setting subsection defines noise and vibration terminology; describes the current noise conditions near the project site; provides the results of ambient noise measurements conducted by BASELINE Environmental Consulting (BASELINE); and summarizes the relevant guidance, plans, and policies for evaluating and regulating noise and vibration. The Impacts and Mitigation Measures subsection assesses the potential impacts of the project – including both temporary noise and vibration generated during construction and long-term, post-construction effects – and provides mitigation measures in response to those identified impacts.

1. Environmental Setting

The following discussion provides noise and vibration background information, summarizes the existing noise environment, and describes relevant noise and vibration regulations.

a. General Information on Noise

Noise is commonly defined as unwanted sound that annoys or disturbs people and can have an adverse psychological or physiological effect on human health. Sound is measured in decibels (dB), which is a logarithmic scale. Decibels describe the purely physical intensity of sound based on changes in air pressure, but they cannot accurately describe sound as perceived by the human ear because the human ear is only capable of hearing sound within a limited frequency range. For this reason, a frequency-dependent weighting system is used and monitoring results are reported in A-weighted decibels (dBA). Decibels and other technical terms are defined in Table V.J-1. Typical A-weighted noise levels at specific distances are shown for different noise sources in Table V.J-2.

In an unconfined space (e.g., outdoors), noise attenuates with distance according to the inverse square law. Noise levels at a known distance from point sources are reduced by 6 dBA for every doubling of that distance for hard surfaces such as cement or asphalt surfaces, and 7.5 dBA for every doubling of distance for soft surfaces such as undeveloped or vegetative surfaces.[1] Noise levels at a known distance from line sources (e.g., roads, highways, and railroads) are reduced by 3 dBA for every doubling of the distance for hard surfaces and 4.5 dBA for every doubling of distance for soft surfaces.[2]

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[1] California Department of Transportation (Caltrans), 1998. Technical Noise Supplement: A Technical Supplement to the Traffic Noise Analysis Protocol.

[2] Ibid.

TABLE V.J-1 DEFINITION OF ACOUSTICAL TERMS

Term	Definition
Decibel (dB)	A unit describing the amplitude of sound on a logarithmic scale. Sound described in decibels is usually referred to as sound or noise "level." This unit is not used in this analysis because it includes frequencies that the human ear cannot detect.
Vibration Decibel (VdB)	A unit describing the amplitude of vibration on a logarithmic scale.
Frequency (Hz)	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level (dBA)	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this report are A-weighted.
Equivalent Noise Level (L_{eq})	The average A-weighted noise level during the measurement period. For this CEQA evaluation, L_{eq} refers to a 1-hour period unless otherwise stated.
Community Noise Equivalent Level (CNEL)	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 to 10:00 p.m. and after addition of 10 decibels to sound levels during the night between 10:00 p.m. and 7:00 a.m.
Day/Night Noise Level (Ldn)	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured during the night between 10:00 p.m. and 7:00 a.m.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Peak Particle Velocity (PPV)	The maximum instantaneous peak of a vibration signal.
Root Mean Square (RMS) Velocity	The average of the squared amplitude of a vibration signal.

Source: Compiled by BASELINE Environmental Consulting.

Greater decreases in noise levels can result from the presence of intervening structures or buffers.

A typical method for determining a person's subjective reaction to a new noise is by comparing it to existing conditions. The following describes the general effects of noise on people:[3]

- A change of 1 dBA cannot typically be perceived, except in carefully controlled laboratory experiments.

[3] Charles M. Salter Associates, 1998. Acoustics – Architecture, Engineering, the Environment, William Stout Publishers.

TABLE V.J-2 TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY

Noise Source (Distance in Feet)	dBA	Subjective Impression
Civil Defense Siren (100)	130	Pain Threshold
Jet Takeoff (200)	120	
Rock Music Concert (50)	110	
Pile Driver (50)	100	Very Loud
Ambulance Siren (100)	90	
Diesel Locomotive (25)	85	Loud
Pneumatic Drill (50)	80	
Freeway (100)	70	Moderately Loud
Vacuum Cleaner (10)	60	
Light Traffic (100)	50	
Large Transformer (200)	40	Quiet
Soft Whisper (5)	30	Threshold of Hearing

Source: Arnold P.G. Peterson, 1996. Handbook of Noise Measurement.

- A 3-dBA change is considered a just-perceivable difference.
- A minimum of a 5-dBA change is required before any noticeable change in community response is expected.
- A 10-dBA change is subjectively perceived as approximately a doubling (or halving) in loudness.

Because sound pressure levels are based on a logarithmic scale, they cannot be added or subtracted in the usual arithmetical way. For instance, if one noise source emits a sound level of 90 dBA, and a second source is placed beside the first and also emits a sound level of 90 dBA, the combined sound level is 93 dBA, not 180 dBA. When the difference between two noise levels is 10 dBA or more, the amount to be added to the higher noise level is zero. In such cases, no adjustment factor is needed because adding in the contribution of the lower noise source makes no perceptible difference in what people can hear or measure. For example if one noise source generates a noise level of 95 dBA and another noise source is added that generates a noise level of 80 dBA, the higher noise source dominates and the combined noise level will be 95 dBA.

b. General Information on Vibration

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. Typically, groundborne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors, defined as land uses where noise-sensitive people may be present or where noise-sensitive activities may occur, to vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment. Vibration amplitudes are usually expressed as either peak particle velocity (PPV) or root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous peak of the vibration signal. PPV is appropriate for evaluating potential damage to buildings, but it is not suitable for evaluating human response to vibration because it takes the human body time to respond to vibration signals. The response of the human body to vibration is dependent on the average amplitude of a vibration. The RMS of a signal is the average of the squared amplitude of the signal and is more appropriate for evaluating human response to vibration. PPV and RMS are normally described in units of inches per second (in/sec), and RMS is also often described in VdB.

c. Local Noise and Vibration Environment

The local noise and vibration environment, including sensitive receptors and existing noise conditions, is described below.

(1) Sensitive Receptors

Sensitive receptors are defined as land uses where noise-sensitive people may be present or where noise-sensitive activities may occur. Examples of noise-sensitive land uses include residences, schools, hospitals, and retirement homes. Examples of noise-sensitive activities are those that occur in locations such as churches and libraries. As discussed in *Chapter III, Project Description*, the levee is divided into eight distinct segments to more clearly provide site-specific detail (Figure III-1). Also discussed in *Chapter III*, the proposed project includes two scenarios: (1) 2050 Sea Level Rise and (2) 2100 Sea Level Rise. The 2100 Sea Level Rise scenario takes into account the maximum sea level rise among both scenarios, thereby requiring more sheet pile floodwalls, a longer construction period, and a wider footprint (i.e., closer to the sensitive receptors).

The nearest sensitive receptors to each segment of the project are residences. As summarized in Table V.J-3, the distances to nearby residences range from approximately 5 to 685 feet under the 2050 Sea Level Rise scenario and from 5 to 680 feet under the 2100 Sea Level Rise scenario.

TABLE V.J-3 DISTANCES TO SENSITIVE RECEPTORS

		Distance to Closest Residential Receptor (Feet)	
Location	**Reference points**	**2050 Sea Level Rise Scenario**	**2100 Sea Level Rise Scenario**
Segment 1	San Mateo City Limit to Mariners Point Golf Center	550	545
Segment 2	Mariners Point Golf Center to San Mateo Bridge/SR 92	685	680
Segment 3	San Mateo Bridge/SR 92 to Beach Park Boulevard/Tarpon Street	75	70
Segment 4	Beach Park Boulevard/Tarpon Street to Foster City Boulevard	80	70
Segment 5	Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park	45	40
Segment 6	Belmont Slough to Gateshead Park	25	20
Segment 7	Gateshead Park to Port Royal Park	20	15
Segment 8	Port Royal Park to Belmont City Limit	5	5

Note: Distances are measured from the closest residence property line to the landside boundary of the 2100 Sea Level Rise scenario project footprint and the 2050 Sea Level Rise project scenario footprint.

Other sensitive receptors in close proximity to the project site include Bayside Community Church and Bowditch Middle School, both of which are located on Beach Park Boulevard and approximately 90 feet west of segment 3 and segment 4 respectively of the project site under the 2050 Sea Level Rise scenario (75 feet under the 2100 Sea Level Rise scenario). Saint Luke Catholic Church is located approximately 120 feet west of segment 4 under the 2050 Sea Level Rise scenario (100 feet under the 2100 Sea Level Rise scenario).

(2) Ambient Noise and Vibration

The primary noise sources in the vicinity of the project site are as follows:

1. Traffic on East 3rd Avenue, which runs east to west and parallel to segments 1 and 2 of the project site.
2. Traffic on State Route (SR) 92, which runs southwest to northeast across eastern portion of segment 2 of the project site.
3. Traffic on Beach Park Boulevard, which runs northwest to southwest and parallel to segments 3 and 4 of the project site.

4. Traffic on U.S. Highway (US) 101, which runs southeast to northwest approximately 300 feet west of the western end of segment 8 of the project site.
5. Aircraft noise from San Francisco International Airport and San Carlos Municipal Airport.[4]

Figure III-1 shows the locations of the major roads described above relative to the eight levee segments. There are no sources of ambient vibration at or in the vicinity of the project site. The primary noise sources in the vicinity of the identified staging areas in Figure III-1 are as follows:

1. Traffic on East 3rd Avenue, which runs east-to-west, north of a 0.6-acre staging located in a parking lot behind three water towers, southeast of the intersection of East 3rd Avenue and Foster City Boulevard.
2. Traffic on SR 92, which runs southwest-to-northeast, northeast of a 0.8-acre staging area in a dirt lot, east of a 0.3-acre staging area in a dirt lot, and west of a 0.2-acre staging area in a dirt area with picnic benches.
3. Traffic on Beach Park Boulevard, which runs northwest-to-southwest, west of a 5.4-acre staging area located along Beach Park Boulevard between Bridgeview Park and Foster City Boulevard.
4. Aircraft noise from San Francisco International Airport and San Carlos Municipal Airport.[5]

However, because the staging areas for the proposed project may change, the primary noise sources in the vicinity of the potential staging areas may change accordingly.

General Plan and Airport Land Use Compatibility Plan

The City of Foster City General Plan Noise Element, adopted in 1993, describes noise levels generated by major roadways in 1990 and predicts the noise levels anticipated by 2005.[6] The predicted 2005 noise levels for the roadways and highways that are the primary sources of noise in the vicinity of the project site are summarized in Table V.J-4 below.

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[4] City of Foster City, 1993. *General Plan, Chapter 6: Noise Element*. Adopted May.
[5] Ibid.
[6] Ibid.

TABLE V.J-4 NOISE LEVELS FOR ROADWAYS AND HIGHWAYS IN THE PROJECT VICINITY

Roadways and Highways	Noise Levels at 50 Feet from the Centerline (dBA Ldn)
East 3rd Avenue from Anchor Road to SR 92	72–74
SR 92 from Foster City Boulevard to San Mateo Bridge/SR 92	83
Beach Park Boulevard from Gull Avenue to Shell Boulevard	63–65
US 101 from Hillsdale Boulevard to Marine Parkway	85

Source: City of Foster City, 1993, op cit.

Based on the additive properties of noise, traffic volumes would have to nearly double in order to substantially increase noise levels. Traffic volumes on SR 92 and US 101 near the project site have increased by approximately 5 percent and 1 percent since 2005, respectively.[7,8] Traffic volumes along East 3rd Avenue and Beach Park Boulevard would be expected to increase if there was a near doubling of the population of Foster City since 2005 or if there were substantial changes in land use since 2005. However, the population of Foster City has increased by approximately 4 percent since 2005[9] and there have been no major changes to the distribution of commercial, industrial, and residential land uses in the project vicinity according to historical photos review.[10] Consequently, traffic-generated noise levels are not anticipated to have increased enough to generate a substantial increase in noise from 2005 estimates, and these noise estimates are still considered reasonable. Aircraft operations associated with San Francisco International Airport (located approximately 6.5 miles northwest of the project site) and San Carlos Airport (located 1.5 miles south of the project site) also contribute to the noise environment at the project site. Segment 1, segment 2, and the northwestern portion of segment 3 are located within Area B of San Francisco International Airport,[11] which

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[7] State of California Business, Transportation and Housing Agency, Department of Transportation. 2006. *2005 Traffic Volumes on the California State Highway System*. Prepared in cooperation with the U.S. Department of Transportation Federal Highway Administration. June.

[8] State of California Business, Transportation and Housing Agency, Department of Transportation. 2015. *2014 Traffic Volumes on California State Highways*. Prepared in cooperation with the U.S. Department of Transportation Federal Highway Administration.

[9] City of Foster City, 2016. *General Plan, Chapter 3: Land Use and Circulation Element Update*. Adopted February 1.

[10] 37°33'08.08''N and 122°15'53.93''W. Google Earth 12/31/2004 and 4/5/2016, accessed June 13, 2016.

[11] City/County Association of Governments of San Mateo County (C/CAG), 2012b, Comprehensive Airport Land Use Compatibility Plan for the Environs of San Francisco International Airport, Exhibit IV-1 & IV-4, November.

includes all land exposed to aircraft noise above 65 dB CNEL or higher.[12] The project site is located outside of Area B of San Carlos Airport,[13] which includes all land exposed to aircraft noise above 55 dB CNEL or higher.[14] Therefore, aircraft noise from San Francisco International Airport is assumed to be above 65 dB CNEL at segment 1, segment 2, and the northwestern portion of segment 3. Aircraft noise from the San Carlos Airport at the project site is below 55 dB CNEL.

As summarized in Table V.J-5, the combined noise impact from aircraft operations and traffic from major roadways in Foster City is expected to cause a relatively higher ambient noise environment in the vicinity of segments 1 and 2 than in the other segments. The estimated noise levels at segments 1 and 2 are approximately 73–74 dBA Ldn at 50 feet from the centerline of the major roadway. Ambient noise environment in the vicinity of the northwestern portion of segment 3 is approximately 67–68 dBA Ldn at 50 feet from the centerline of the major roadway. It is also anticipated that highway noise from SR 92 increases the ambient noise environment in the vicinity of the eastern end of segment 2, and US 101 increases the ambient noise environment in the vicinity of the western end of segment 8. The majority of the project site has no major noise sources in the vicinity, remaining at ambient noise levels of approximately 63–65 dBA Ldn at 50 feet from the centerline of the major roadway or lower.

Short-Term Noise Level Measurements

On May 13, 2016, BASELINE measured short-term (15-minute) noise levels at six locations within the project site to further characterize the ambient noise levels in the vicinity. These noise level measurements were consistent with the General Plan's characterization of the noise environment and with the compatibility plans for both airports discussed above. Noise levels were highest at measurement locations located within Area B of San Francisco International Airport and locations near SR 92 and US 101.

The ambient noise level measurement locations are shown in Appendix E. The numerical summaries of the ambient noise level measurements are presented in Table V.J-6. The specific noise measurement locations, equipment, and methodology are described in the Noise Measurements Data Report (Appendix E).

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[12] City/County Association of Governments of San Mateo County, (C/CAG) 2012, op.cit.

[13] City/County Association of Governments of San Mateo County (C/CAG), 2015. Comprehensive Airport Land Use Compatibility Plan for the Environs of San Carlos Airport. Adopted October.

[14] City/County Association of Governments of San Mateo County (C/CAG), 2015, op.cit.

TABLE V.J-5 AMBIENT NOISE ENVIRONMENT AND PRIMARY NOISE SOURCES

Location	Reference points	Ambient Noise Levels at 50 Feet (dBA Ldn)[a]	Primary Noise Sources
Segment 1	San Mateo City Limit to Mariners Point Golf Center	73–74	Traffic from East 3rd Avenue (72–74 dBA Ldn) and aircraft operations (65 dB CNEL)
Segment 2	Mariners Point Golf Center to San Mateo Bridge/SR 92	73–74 83 (eastern end)	Traffic from East 3rd Avenue (72–74 dBA Ldn) and aircraft operations (65 dB CNEL); Eastern end: traffic from SR 92 (83 dBA Ldn)
Segment 3	San Mateo Bridge/SR 92 to Beach Park Boulevard/Tarpon Street	67–68 (northwestern portion); 63–65 (the rest)	Traffic on Beach Park Boulevard (63–65 dBA Ldn) and aircraft operations (65 dB CNEL at northwestern portion)
Segment 4	Beach Park Boulevard/Tarpon Street to Foster City Boulevard	63–65	Traffic on Beach Park Boulevard
Segment 5	Beach Park Boulevard/Foster City Boulevard to Sea Cloud Park	63–65	Traffic on Beach Park Boulevard
Segment 6	Belmont Slough to Gateshead Park	<63–65	No major noise sources
Segment 7	Gateshead Park to Port Royal Park	<63–65	No major noise sources
Segment 8	Port Royal Park to Belmont City Limit	85 (western end); <63–65 (the rest)	No major noise sources (US 101 at the western end)

[a] Based on the additive properties of noise, both noise from roadway traffic and aircraft operations are considered to contribute to the ambient noise environment. Noise contour unit is expressed in dB CNEL and is regarded as dBA CNEL in this analysis.
Source: Noise Measurements Data Report (Appendix E).

d. Regulatory Setting

Noise standards applicable to this project are promulgated by the State of California, the Foster City General Plan, and the noise ordinance of the Foster City Municipal Code. The State of California provides guidance for the preparation of noise elements in General Plans. In California, noise is primarily regulated at the local level, through the implementation of General Plan policies and local noise ordinances. The purpose of local General Plans is to identify the general principles intended to guide land use and development, and the purpose of the ordinances is to specify the standards and requirements for implementing the principles of the General Plan.

TABLE V.J-6 STATISTICAL SUMMARY OF AMBIENT NOISE MEASUREMENTS

Location ID	Measurement Duration (Minutes)	dBA			Primary Noise Source
		L_{eq}	L_{max}	L_{min}	
M-1 (within Segment 2)	15	61.7	75.8	44.2	Traffic on East 3rd Avenue and aircraft operations
M-2 (near eastern end of Segment 2)	15	68.7	79.0	62.3	Traffic on SR 92, aircraft operations, and geese in the park
M-3 (within Segment 3)	15	59.8	78.4	44.2	Traffic on Beach Park Boulevard, aircraft operations, and Bowditch Middle School (from broadcasting and students)
M-4 (within Segment 4)	15	53.8	65.8	41.4	Traffic on Beach Park Boulevard, traffic from Foster City Boulevard turning on Beach Park Boulevard, and aircraft operations
M-5 (near Segment 5)	15	55.5	71.6	42.9	Aircraft operations and noise from the crows
M-6 (western end of Segment 8)	15	60.8	74.5	56.3	Traffic on US 101 and a barking dog

Source: BASELINE, 2016. Noise Field Measurements Data Report.

(1) State Regulations

California Noise Control Act

Sections 46000–46080 of the California Health and Safety Code codify the California Noise Control Act (CNCA) of 1973. This act established the Office of Noise Control under the California Department of Health Services. The CNCA requires that the Office of Noise Control adopt, in coordination with the California Office of Planning and Research (OPR), guidelines for the preparation and content of noise elements for General Plans. The most recent guidelines are contained in General Plan Guidelines, published by the OPR in 2003[15]; this document provides land use compatibility guidelines for cities and counties to use in General Plans to reduce conflicts between land use and noise.

California Occupational Safety and Health Administration

Noise exposure of construction workers is regulated by the California Occupational Safety and Health Administration (Cal/OSHA). Title 8, Subchapter 7, Group 15, Article 105 of the California Code of Regulations (Control of Noise Exposure) sets noise exposure limits for workers, and requires employers who have workers that may be exposed to noise levels

[15] California Office of Planning and Research, 2003. General Plan Guidelines.

above these limits to establish a hearing conservation program, make hearing protectors available, and keep records of employee noise exposure measurements.

(2) City Regulations

Foster City General Plan

The Noise Element of the Foster City General Plan[16] establishes goals, policies, and programs intended to protect the community from excessive noise. The policies applicable to the project are as follows:

> *Policy N-5: Mitigating Impacts on Surrounding Uses.* The City will require proposals to reduce noise impacts on adjacent properties through the following and other means, as appropriate:
>
> a. Screen and control noise sources such as parking, outdoor activities and mechanical equipment.
> b. Increase setbacks for noise sources from adjacent dwellings.
> c. Wherever possible do not remove fences, walls or landscaping that serve as noise buffers, although design, safety and other impacts must be addressed.
> d. Use soundproofing materials and double glazed windows.
> e. Control hours of operation, including deliveries and trash pickup to minimize noise impacts.
>
> *Policy N-8: Protecting Existing Residential Areas.* Protect the noise environment in existing residential areas. In general, the city will require the evaluation of mitigation measures for projects that would cause the Ldn to increase by 3 dB or more, if the increase would result in an Ldn greater than 60 dB or if the Ldn already exceeds 60 dB. Projects with the potential to generate significant adverse community controversy must also be evaluated. Noise created by commercial or industrial sources associated with new projects, developments or new or existing activities conducted by existing developments or companies shall be controlled so as not to exceed the noise level standards set forth in "Noise and Land Use Compatibility Standards for Industrial and Commercial Noise Sources" table as measured at any affected residential land use.
>
> *Policy N-13: Noise Ordinance.* The City will apply the quantitative noise ordinance standards throughout the City.

Foster City Municipal Code

The City of Foster City has established regulations in the Noise Section (17.68.030) of the Municipal Code. The following sections are applicable to the proposed project:

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[16] City of Foster City, 1993, op. cit.

17.68.030(E). Prohibited Acts
4. Permitting the operation of any tools, or equipment used in construction, repair, alteration, demolition or landscape maintenance prior to 7:30 a.m. or after 8:00 p.m. on weekdays and before 9:00 a.m. or after 8:00 p.m. on weekends and legal holidays, in a residential district or within 100 yards of a residential district, or during other hours such that the noise level from a single or multiple sources exceeds 100 dBA at the producer's property plane[17] unless prior City authorization is obtained, pursuant to Section 17.68.030(F)(7).

17.68.030(F). Exemptions
7. The operation of any tools or equipment used in construction, repair, alteration, demolition, or landscape maintenance between the hours of 7:30 a.m. and 8:00 p.m. on weekdays and between the hours of 9:00 a.m. and 8:00 p.m. on weekends and legal holidays in a residential district or within one hundred yards of a residential district is allowed, subject to the following: the noise level from a single or multiple source shall not exceed 100 dBA at the producer's property plane, unless prior authorization is obtained for such activities by the director of planning and development services. Such approvals may require special mitigation measures as determined by the director of planning and development services.

17.68.040. Vibration
No vibration shall be permitted so as to cause a noticeable tremor, measurable without instruments at the lot line.

2. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to noise and vibration that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the noise and vibration impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

For the purposes of this analysis and based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would have a potentially significant impact if it would:

- Expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose persons to or generate excessive groundborne vibration or groundborne noise levels;

[17] "Property plane" means an imaginary vertical plane, including the property line, which determines the property boundaries in space.

- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project and in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project and in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

b. Methodology and Assumptions

This analysis considers increase in noise associated with traffic of 5 dBA or more over existing ambient noise levels to be a significant increase. For this project, noise associated with traffic would only occur during project construction because the project would not result in any changes in traffic after construction. Construction noise at the project site or associated staging areas would be significant if it would conflict with applicable regulations in the Foster City Municipal Code (i.e. exceeding 100 dBA at the producer's property plane). To determine whether the project has the potential to increase operational noise and vibration, this analysis qualitatively compares the frequency and intensity of the existing sources of noise and vibration before and after the proposed project. The proposed project would have a significant impact if it would increase the frequency and intensity of the existing sources of noise and vibration or generate new sources of noise and vibration during project operation. Operational noise at the project site would be significant if it conflicts with applicable regulations in 17.68.030(F) of the Foster City Municipal Code.

Vibration levels would be significant if they exceed the Federal Transit Administration's recommended vibration thresholds to prevent disturbance to people and damage to buildings.[18] Table V.J-7 and Table V.J-8 summarize the vibration criteria to prevent disturbance of occupants and to prevent damage to structures, respectively. In this analysis, the "Infrequent Events" criterion is applied to construction equipment and "Reinforced-concrete, steel or timber (on plaster)" is chosen as the building category.

[18] Federal Transit Administration, 2006. Transit Noise and Vibration Impact Assessment (FTA-VA-90-1003-06).

TABLE V.J-7 VIBRATION CRITERIA TO PREVENT DISTURBANCE – RMS (VDB)

Land Use Category	Frequent Events[a]	Occasional Events[b]	Infrequent Events[c]
Residences and buildings where people normally sleep	72	75	80

[a] More than 70 vibration events of the same kind per day or vibration generated by a long freight train.
[b] Between 30 and 70 vibration events of the same kind per day.
[c] Fewer than 30 vibration events of the same kind per day.
Source: Federal Transit Administration, 2006, op. cit.

TABLE V.J-8 VIBRATION CRITERIA TO PREVENT DAMAGE TO STRUCTURES

Building Category	PPV (in/sec)	RMS (VdB)
Reinforced-concrete, steel or timber (no plaster)	0.5	102
Engineered concrete and masonry (no plaster)	0.3	98
Non-engineered timber and masonry buildings	0.2	94
Buildings extremely susceptible to vibration damage	0.12	90

Source: Federal Transit Administration, 2006, op. cit.

c. Less-Than-Significant Noise and Vibration Impacts

The following discussion describes the less-than-significant impacts associated with noise and vibration that would result from the proposed project.

(1) Noise Generated During Project Operation

The operational period for the 2050 Sea Level Rise scenario is 30 years and for the 2100 Sea Level Rise scenario is 80 years. The operation activities would consist of maintenance of the levee, trail, and sheet pile walls. As discussed in *Chapter III, Project Description*, because levee and trail maintenance would be similar to current practices, it would not be expected to introduce new noise sources or increase the frequency or intensity of existing sources of noise on the project site. As discussed in *Chapter III, Project Description*, the sheet pile walls would require additional maintenance that includes routine graffiti removal and/or wall recoating, routine guard rail cleaning and periodic repair, and occasionally monitoring of the rate of loss of sheet pile material due to corrosion. The additional sheet pile wall maintenance work would not be expected to require the use of engine-driven construction equipment or impact tools, and therefore not expected to generate noise of 100 dBA or greater outside the footprint of either the 2050 Sea Level

Rise scenario or the 2100 Sea Level Rise scenario.[19] Furthermore, the additional maintenance work would be required to comply with Section 17.68.030 of the noise ordinance, which restricts maintenance work hours to between the hours of 7:30 a.m. and 8:00 p.m. on weekdays and 9:00 a.m. and 8:00 p.m. on weekends. This would limit the potential of disturbance of nearby sensitive receptors. Therefore, the potential of the operational period of proposed project to expose persons to noise in excess of standards or to a substantial temporary or permanent increase in noise levels is less than significant.

(2) Vibration Generated During Project Operation

There are no existing sources of vibration, and the operation of the proposed project would not introduce new vibration sources. The maintenance of the levee and trail would be similar to current practices, and the additional maintenance required for the sheet pile walls would not involve engine-driven construction equipment or impact tools that generate vibration. Therefore, the potential of the operational period of the proposed project to expose persons to or generate groundborne vibration in excess of standards is less than significant.

(3) Aircraft Noise

The project site is not located within the vicinity of a private airstrip. Although the project site is located in the vicinity of a two public airports, the proposed project would not increase the number of housing or commercial buildings to introduce new residents or users to the project site. Therefore, the potential of the proposed project to expose people in the project area to excessive noise from any public use airport or private airstrip is less than significant.

d. Significant Noise and Vibration Impacts and Mitigation Measures

Four significant impacts related to noise and vibration could result from project implementation, as discussed below.

(1) Noise from Hauling Trucks on Area Roadways

<u>Impact NOISE-1</u>: Noise from hauling trucks on area roadways associated with the Levee project construction could generate noise levels that disturb nearby receptors. (S)

Construction of the proposed project would include hauling trucks that would transport fill materials to the staging areas and from the staging areas to construction access points

[19] The 2050 Sea Level Rise scenario footprint and the 2100 Sea Level Rise scenario footprint are considered as the producer's property planes in this analysis.

(Figure III-11). The 2100 Sea Level Rise scenario would require more sheet pile floodwalls and more fill, and thus would generate more hauling truck trips on area roadways. Therefore, noise from hauling trucks on area roadways is conservatively analyzed under the 2100 Sea Level Rise scenario. As indicated in the traffic study,[20] hauling trucks would make up less than 1.6 percent of daily traffic volumes on any one roadway segment in Foster City, with the vast majority of roadway segments experiencing less than 0.5 percent traffic volume increases as a result of hauling trucks associated with the proposed project. Table V.J-9 below summarizes the existing and existing plus hauling truck traffic noise for roadway segments that would experience more than 0.5 percent traffic volume increases as a result of hauling trucks. Traffic noise is expected to increase by approximately 0.5 to 1.0 dBA L_{eq} along these roadway segments. Because these roadway segments have the greatest predicted increase in hauling trucks, traffic noise increases due to hauling trucks along other roadway segments would be less than 1.0 dBA L_{eq}. This is below the 5-dBA significance threshold for project-generated traffic noise. Consequently, the potential of the proposed project to result in a significant increase in traffic noise due to hauling trucks along local area roadways is less than significant. However, noise from hauling trucks on area roadways could still have the potential to generate noise levels that would disturb nearby receptors temporarily during construction. This is conservatively considered a significant impact.

> <u>Mitigation Measure NOISE-1</u>: Truck arrival and unloading operations shall be conducted in accordance with all applicable City Ordinance requirements. If noise associated with truck arrival or unloading operations becomes a problem (i.e., multiple complaints are received by the City or its contractors from nearby receptors), the contractor shall work with the City to develop and implement measures to minimize noise, including requiring an adjustment of truck arrival and/or unloading times and other feasible measures. City staff shall communicate regularly with those making the complaints to ensure that the issue is satisfactorily resolved. (LTS)

Mitigation Measure NOISE-1, which requires the development and implementation of a plan to minimize noise (including requiring an adjustment of truck arrival and/or unloading times), would reduce the noise impact from hauling trucks on area roadways to a less-than-significant level.

(2) Noise from Hauling Trucks along the Levee

<u>Impact NOISE-2</u>: Noise from hauling trucks along the levee associated with Levee project construction could generate noise levels that disturb nearby receptors. (S)

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[20] Appendix E.

Construction of the proposed project would include hauling trucks that would transport fill materials from the construction access points to the work areas along the levee (Figure III-11). The 2100 Sea Level Rise scenario would require more sheet pile floodwalls and more fill, and thus would generate more hauling truck trips along the levee. Therefore, noise from hauling trucks along the levee is conservatively analyzed under the 2100 Sea Level Rise scenario. Noise generated by truck traffic along the levee was compared to the ambient noise level measurements presented in Table V.J-6. As summarized in Table V.J-10, traffic noise would be expected to increase by approximately 1.6 to 3.2 dBA L_{eq} along levee segments 1 through 8. These increases are below the 5-dBA significance threshold for project-generated traffic noise.

Consequently, the potential of the proposed project to result in a significant increase in traffic noise due to the hauling trucks along the levee would be less than significant. However, noise from hauling trucks along the levee could still have the potential to generate noise levels that would disturb nearby receptors temporarily during construction. This is conservatively considered a significant impact.

Mitigation Measure NOISE-2: Implement Mitigation Measure NOISE-1. (LTS)

Mitigation Measure NOISE-2 which provides for the development and implementation of measures to minimize noise (including requiring an adjustment of truck arrival and/or unloading times) would reduce the noise impact from hauling trucks along the levee to a less-than-significant level.

(3) Construction Noise

Construction is expected to occur over a period of about 1.5–2 years for the 2050 Sea Level Rise scenario and about 2–2.5 years for the 2100 Sea Level Rise scenario (though the schedules are subject to change). Construction noise levels at the nearest sensitive receptors would vary from day to day, depending on the number and condition of the equipment being used, the types and duration of activity being performed, the distance between the noise source and the sensitive receptor, and the presence or absence of barriers, if any, between the noise source and sensitive receptor. As discussed in *Chapter III, Project Description*, construction activities would consist of three primary activities: (1) sheet pile placement and/or wall construction; (2) fill placement and Bay Trail reconstruction; and (3) wall aesthetic enhancement and landscaping.

TABLE V.J-9 EXISTING AND EXISTING PLUS PROJECT TRAFFIC VOLUMES AND PREDICTED TRAFFIC NOISE ON AREA ROADWAYS

Number	Roadway Segment	Existing Hourly Traffic (Trips)	Hauling Trucks Added Per Hour for a Particular Phase (Trips)	Existing Traffic Noise (dBA L_{eq} at 50 Feet)	Existing Plus Hauling Truck Traffic Noise (dBA L_{eq} at 50 Feet)	Estimated Increase in Noise (dBA L_{eq} at 50 Feet)
1	East 3rd Avenue East of Foster City Boulevard	939	15 (Phase 5)	65.5	66.3 (Phase 5)	0.8 (Phase 5)
2	Beach Park Boulevard Northeast of Gull Avenue	600	6 (Phase 3)	61.7	62.4 (Phase 3)	0.7 (Phase 3)
3	Beach Park Boulevard between Egret Court and Sanderling Street	442	3 (Phase 3) 3 (Phase 1)	60.4	60.9 (Phase 3) 60.9 (Phase 1)	0.5 (Phase 3) 0.5 (Phase 1)
4	Beach Park Boulevard between Gull Avenue and Marlin Avenue	440	3 (Phase 3) 3 (Phase 1)	60.4	60.9 (Phase 3) 60.9 (Phase 1)	0.5 (Phase 3) 0.5 (Phase 1)
5	Pitcairn Drive between Edgewater Boulevard and Melbourne Street	608	4 (Phase 2)	57.6	58.6 (Phase 2)	1.0 (Phase 2)

Notes:
1. Refer to Figure III-16 in the Project Description for a definition of the different phases
2. Hourly traffic and hauling truck trips are calculated based on an eight-hour work day (assuming the same number of traffic and hauling truck trips within each hour). Existing hourly traffic is conservatively assumed to consist only of automobiles; this assumption generates the lowest possible estimate of existing traffic noise. The 20-ton trucks that would be used to transport materials are conservatively regarded as heavy trucks in the traffic model to generate the highest possible estimate of existing plus project traffic noise.
3. Data are based on the 2100 Sea Level Rise scenario.
4. FHWA TNM Version 2.5 model was used for these results.
Source: Traffic Study Reference; Traffic model outputs for area roadways (Appendix E).

TABLE V.J-10 AMBIENT NOISE, PROJECT TRAFFIC VOLUMES, AND PREDICTED TRAFFIC NOISE ON THE LEVEE

Construction Segment	Hauling Trucks Added Per Hour for a Particular Phase[a]	Ambient Noise Levels (dBA L_{eq})[b]	Hauling Truck Traffic Noise on the Levee (dBA L_{eq} at 50 Feet)[c]	Ambient Noise Plus Hauling Truck Traffic Noise (dBA L_{eq} at 50 feet)	Estimated Maximum Increase in Noise (dBA L_{eq} at 50 Feet)
1	2 (Phase 5)	61.7	50.2 (Phase 5)	62.0	0.3
2	9 (Phase 5)	61.7	56.7 (Phase 5)	62.9	1.2
3	12 (Phase 3)	59.8	58.0 (Phase 3)	62.0	2.2
4	5 (Phase 1)	53.8	54.2 (Phase 1)	57.0	3.2
5	2 (Phase 2)	55.5	50.2 (Phase 2)	56.6	1.1
6	2 (Phase 4)	53.8	50.2 (Phase 4)	55.4	1.6
7	2 (Phase 2)	53.8	50.2 (Phase 2)	55.4	1.6
8	2 (Phase 4)	53.8	50.2 (Phase 4)	55.4	1.6

[a] Data are based on the 2100 Sea Level Rise scenario. Total hauling truck loads are calculated by dividing the bulk fill volume by the 10-ton truck capacity (assuming 9 cubic yards). Hauling truck trips are then calculated by dividing the total loads by the construction duration, considering round trips. Hourly truck trips are calculated based on an eight-hour work day (assuming the same number of hauling truck trips within each hour). Note that, since only two truck trips are estimated daily on segments 7 and 8, this analysis conservatively assumes two truck trips per hour for these segments. Refer to Figure III-16 in the Project Description for a definition of the different phases.

[b] Ambient noise levels for each segment are derived from the noise level measurements presented in Table V.J-6. Note that 1) the noise level measurement obtained within segment 2 (an area surrounded by research parks and recreational land uses) is also assumed to represent the ambient noise level within segment 1 (an area surrounded by research parks and recreational land uses), and 2) the noise level measurement within segment 4 (a quiet residential area) is also assumed to represent the ambient noise levels within segments 6 through 8 (also quiet residential areas).

[c] The 10-ton trucks that would be used to transport material along the levee are conservatively regarded as heavy trucks in the traffic model to generate the highest possible estimate of traffic noise along the levee. The average truck speed was assumed to be 15 mph.

FHWA TNM Version 2.5 model was used for these results.
Source: Traffic Study Reference. Traffic model outputs for the levee (Appendix E).

Impact NOISE-3: The operation of the construction equipment on the Levee project site and in the staging areas could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving). (S)

The noise generated from construction of the proposed project would occur as a result of the use of construction equipment on the project site, including in the staging areas. Table V.J-11 shows the reference noise levels associated with various types of construction equipment that would be used during each phase of construction. Based on the additive properties of noise, the combined noise levels of the two noisiest pieces of equipment are calculated to represent the noise impact from each phase of construction.[21] Based on the noise levels calculated for each construction activity, sensitive receptors located 60 feet or more from the project site and staging areas would not be subject to construction noise greater than 100 dBA.

Construction workers could be exposed to excessive noise from the heavy equipment used during construction of the proposed project (Table V.J-11). The construction contractor for the proposed project would be subject to these regulations, and compliance with these Cal/OSHA regulations would ensure that the potential of construction workers to be exposed to excessive noise is less than significant.

Section 17.68.030 of the Municipal Code prohibits noise exceeding 100 dBA at the producer's property plane. The property plane for the project site is considered as the project site boundary, which is the 2050 Sea Level Rise scenario footprint and the 2100 Sea Level Rise scenario footprint. The project site boundary for the 2100 Sea Level Rise scenario is slightly larger than the 2050 Sea Level Rise scenario site boundary. Heavy construction equipment would not operate outside these project site boundaries. Based on the results of noise calculation presented in Table V.J-11, noise levels would be less than 100 dBA at a distance of 60 feet or farther. The width of the project site along the levee alignment under any scenario would range from approximately 30 to 50 feet. Although most equipment would operate in the middle of the site at the levee structure, noise levels would be much louder when equipment operates closer to the property plane. Based on the values in Table V.J-11, noise levels generated from the construction activities would have the potential to exceed 100 dBA at the producer's property plane under both the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios. Therefore, the potential of the proposed project to generate noise levels that would exceed City regulations is considered significant.

No residences are located within 60 feet of levee segments 1 through 4 under either the 2050 Sea Level Rise or 2100 Sea Level Rise scenarios (Table V.J-3). Consequently, the proposed project would not expose persons to noise levels greater than 100 dBA along these segments. There are residences located within 60 feet of two staging areas identified in Figure III-1 (the 5.4-acre staging area located along Beach Park Boulevard

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[21] A general assessment of construction noise should include the two noisiest pieces of equipment expected to be used in each construction phase [Source: Federal Transit Administration, 2006, op. cit.].

TABLE V.J-11 NOISE LEVELS FROM CONSTRUCTION EQUIPMENT (DBA) AND A GENERAL ASSESSMENT OF CONSTRUCTION NOISE

Phase	Equipment	Quantity	Noise Level at 50 Feet (dBA)	Addition of Two Noisiest Pieces of Equipment at 50 Feet (dBA)	Noise Level at 60 Feet (dBA)
Sheet pile placement and/or wall construction	Excavator	2	81	101	99
	Crane	2	81		
	Generator	2	81		
	Hammer/Vibratory/Hammer/ Press-type system[a, b]	2	**101**		
	Rubber Tired Dozer	2	82		
	Rubber Tired Loader	2	79		
	Flatbed Truck	3	74		
Fill placement and Bay Trail reconstruction	Grader	1	85	88	86
	Rubber Tired Dozer	1	82		
	Rubber Tired Loader	1	79		
	Water Truck	1	76		
	Tandem Roller	1	80		
	Pneumatic Roller	1	80		
	Sheepsfoot Roller	1	80		
	Paver	1	77		
	Truck Tractor	1	84		
Wall aesthetic enhancement and landscaping	Skid Steer	3	79	86	84
	Hydro-mulcher	1	81		
	Truck Tractor	1	84		

Note: **Bold numbers indicate noise levels exceeding 100 dBA**.
Based on reference noise levels at 50 feet, the following propagation adjustment was applied to estimate noise levels at 60 feet.
$dBA_2 = dBA_1 + 10\ Log_{10}(D_1/D_2)^{2.5}$
Where:
dBA_1 is the reference noise level at a specified distance (in this case 50 feet).
dBA_2 is the calculated noise level.
D_1 is the reference distance (in this case 50 feet).
D_2 is the distance from the equipment to the receiver. (Source of the equation: P.27 of Caltrans Technical Noise Supplement, October 1998.)
[a] The noise level of a vibratory pile driver was conservatively used to estimate the noise levels from pile-driven activity. Although there are two hammers on the equipment list, it is not anticipated that both would be used at the same location. The other equipment would generate much lower noise levels than a vibratory hammer. When the difference between two noise levels is 10 dBA or more, the amount to be added to the higher noise level is zero. Therefore, the loudest noise generated from sheet pile placement and/or wall construction is estimated by using only one vibratory hammer.
[b] No vibratory pile driver would be expected to operate on any staging area. The other construction equipment is conservatively assumed to be used on staging areas.
Source: U.S. Department of Transportation, 2006. FHWA Highway Construction Noise Handbook. August.

between Bridgeview Park and Foster City Boulevard, and the 3.8-acre staging area along the edge of the Dredge Disposal Site on the landward side of the levee, between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough). However, because the staging areas for the proposed project could change, and other potential staging areas could also be located in areas where nearby sensitive receptors are within 60 feet, noise impacts at the staging areas are conservatively considered significant. Furthermore, there are residences located within 60 feet of levee segments 5 through 8 under both the 2050 Sea Level Rise scenario and 2100 Sea Level Rise scenario. Therefore, the proposed project would have the potential to expose sensitive receptors to noise levels greater than 100 dBA along these segments and staging areas. This is a significant impact.

Mitigation Measure NOISE-3: The following five-part mitigation measure shall only apply to the construction activity along segments 5 through 8 and to any staging areas located within 60 feet of a sensitive receptor under both the 2050 Sea Level Rise and the 2100 Sea Level Rise scenarios:

NOISE-3a: Residences and landowners within 60 feet of proposed project (those near segment 5 through segment 8, and near any potential staging area) under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario shall be provided with written notice of construction activity within at least seven days of before work begins. The notice shall state the date of planned construction activity in proximity to that landowner's property and the range of hours during which maximum noise levels are anticipated.

NOISE-3b: For construction activities that will occur within 60 feet of levee segment 5 through segment 8 and near any potential staging area under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario, the City of Foster City shall require the project contractor to submit a Construction Noise Management Plan, prepared by a qualified acoustical consultant, that contains a set of site-specific noise attenuation measures, potentially including the use of movable sound barriers within the project footprint, to further reduce construction noise impacts, for review and approval by the City of Foster City Public Works Department and/or the project team.

NOISE-3c: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement the construction contractor to designate a "noise disturbance coordinator" who shall be responsible for responding to any local complaints about construction noise. The disturbance coordinator shall determine the cause of the noise complaints (e.g., beginning work too early, bad muffler) and institute reasonable measures warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

NOISE-3d: The City of Foster City Public Works Department and/or the project team shall require the project contractor to implement. The construction activities shall be limited to the hours of 8:00 a.m. to 5:00 p.m. on weekdays unless deviations from this schedule are approved in advance by the City. Non-construction activities may take place between the hours of 7:00 a.m. and 8:00 a.m. on weekdays and 9:00 a.m. and 4:00 p.m. on Saturdays, but they must be limited to quiet activities and shall not include the use of engine-driven machinery. No actual construction activities may take place between 7:00 a.m. and 8:00 a.m. Forklifts shall be allowed to operate on site between the hours of 5:00 p.m. and 6:30 p.m. on weekdays. The Planning Commission reserves the right to rescind the expanded forklift hours of operation and further restrict construction activities in the event that the public health, safety, and welfare are not protected due to noise levels emanating from the construction project.

NOISE-3e: The construction contractor, to minimize construction noise impacts, shall use all engine-driven construction vehicles, equipment, and pneumatic tools that shall be required to use effective intake and exhaust mufflers; equipment shall be properly adjusted and maintained; and all construction equipment shall be equipped with mufflers in accordance with Cal/OSHA[22] standards.

NOISE-3f: The construction contractor shall place all stationary construction equipment such that emitted noise is directed away from sensitive receptors nearest the project site.

NOISE-3g: The construction contractor shall locate equipment staging in areas that will create the greatest possible distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

Additional factors that would reduce the severity of this impact include the short-term nature of the impact. Exposure of any given receptor to levels of construction noise greater than 100 dBA would be brief relative to the total duration of each construction activity (Table III-3) because the location where the work for each construction activity is occurring would move along the project alignment over time. More specifically, the construction work would move along the project alignment at a speed of approximately 100 feet per day. Therefore, each phase of the construction work would be expected to last no more than one day within 60 feet of any given residence.

[22] The State of California's The Division of Occupational Safety and Health (DOSH), better known as Cal/OSHA.

Implementation of the five-part mitigation measure NOISE-3 would reduce construction period noise to the extent feasible. However, the construction of the proposed project could still generate noise levels that conflict with the City of Foster City Municipal Code regulations at the producer's property plane temporarily. Therefore, the impact of noise from construction equipment on the project site and in staging areas would conservatively remain significant and unavoidable. (SU)

(4) Construction Vibration

Construction activities can result in varying degrees of ground vibration, depending on the equipment, activity, and relative proximity to sensitive receptors.

Impact NOISE-4: Construction of the Levee project could result in the exposure of nearby receptors to excessive vibration. (S)

The vibration levels for construction equipment that could be used at the project site are summarized in Table V.J-12. Although the table provides one vibration level for each piece of equipment, it should be noted that there is considerable variation in reported ground vibration levels from construction activities, primarily due to variation in soil characteristics. Vibration levels are also calculated at 5, 10 and 15 feet as PPV and 40 and 70 feet as RMS based on the reference levels at 25 feet (also shown in Table V.J-12). Note that no pile drivers are expected to be operated on the staging areas.

Disturbance Vibration

Table V.J-12 above indicates that sensitive receptors located within 70 feet of the project site would be subject to construction vibration greater than the 80-RMS VdB infrequent events disturbance threshold (Table V.J-7). Based on the distance between the nearest sensitive receptors and the project site (Table V.J-3), sensitive receptors located within 70 feet near levee segments 3 through 8 could be exposed to pile-driving vibration levels above the threshold under the 2100 Sea Level Rise scenario, and only receptors located within 70 feet near segments 5 through 8 could be exposed to excessive vibration levels associated with pile driving under the 2050 Sea Level Rise scenario.

Vibration levels from the use of a large bulldozer and loaded truck could be 81 RMS VdB and 80 VdB at 40 feet, respectively, both of which exceed the 80-RMS VdB threshold to disturb sensitive receptors. There are residences located within 40 feet of one staging area identified in Figure III-1 (the 3.8-acre staging area along the edge of the Dredge Disposal Site on the landward side of the levee, between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough). However, because the staging areas for the proposed project could change, and other potential staging areas could also be located in areas where nearby sensitive receptors are located within 40 feet, vibration impacts at the staging areas are conservatively considered significant. Therefore, the

TABLE V.J-12 VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	PPV at 25 Feet (in/sec)	PPV at 5 Feet (in/sec)	PPV at 10 Feet (in/sec)	PPV at 15 Feet (in/sec)	RMS at 25 Feet (VdB)	RMS at 40 feet (VdB)	RMS at 70 Feet (VdB)
Pile Driver (sonic)	0.170	1.901	0.672	0.366	93	--	80
Large bulldozer	0.089	0.995	0.352	0.191	87	81	74
Loaded trucks	0.076	0.850	0.300	0.164	86	80	73

Notes:
1. No pile driver is anticipated to operate on any staging area. The other construction equipment is conservatively assumed to be used on staging areas.
2. Based on vibration levels at 25 feet, the following propagation adjustment was applied to estimate PPV vibration levels at 5, 10, and 15 feet assuming:

$PPV2 = PPV1 \times (D1/D2)^{1.5}$

Where:
PPV1 is the reference vibration level at a specified distance.
PPV2 is the calculated vibration level.
D1 is the reference distance (in this case 25 feet).
D2 is the distance from the equipment to the receiver.

Based on vibration levels at 25 feet, the following propagation adjustment was applied to estimate RMS vibration levels at 40 and 70 feet assuming:

$RMS2 = RMS1 - 30 \operatorname{Log}_{10} (D2/D1)$

Where:
RMS1is the reference vibration level at a specified distance.
RMS2 is the calculated vibration level.
D1 is the reference distance (in this case 25 feet).
D2 is the distance from the equipment to the receiver. (Source of the equations: Federal Transit Administration, Chapter 12, 2006.)

Source of PPV and RMS vibration levels at 25 feet: Federal Transit Administration, 2006, op. cit.

proposed project would have the potential to generate vibration levels that would disturb nearby receptors within 70 feet near segments 5 through 8 and within 40 feet near any potential staging area. This is a significant impact.

<u>Mitigation Measure NOISE-4a</u>: Implement Mitigation Measure NOISE-3c through NOISE-3g.

Implementation of **Mitigation Measure NOISE-4a** would reduce the impacts of exposure of nearby receptors to vibration. In addition, the construction vibration would be temporary (no more one day at any given residence located within 70 feet of the project site or within 40 feet of staging areas) because the location of work for each construction activity would move along the project alignment as construction progressed. Based on the short-term nature of the potential disturbance, this impact would be less than significant.

Vibration Damage

The project could result in vibration levels great enough to cause damage to nearby buildings located within segment 8 of the project site and within 5 feet of potential staging areas. As shown in Table V.J-12, calculated vibration levels at 15 feet could be 0.366 PPV in/sec, which is below the 0.5-PPV in/sec threshold (Table V.J-8) to cause damage to structures. Therefore, vibration levels along segments 1 through 7 would not be expected to damage nearby structures under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario. However, because the nearest residences to segment 8 are as near as 5 feet under the 2050 Sea Level Rise scenario and the 2100 Sea Level Rise scenario, vibration level from the use of a pile driver could be 0.672 PPV in/sec at 10 feet and 1.901 PPV in/sec at 5 feet, which exceed the 0.5-PPV in/sec threshold to cause damage to buildings. Therefore, vibration impacts are considered significant to the residences located within 15 feet from segment 8 of the project site. Vibration level from the use of a bulldozer could be 0.995 PPV in/sec at 5 feet, which exceeds the 0.5-PPV in/sec threshold to cause damage to buildings. There are structures located within 5 feet of one staging area identified in Figure III-1 (the 3.8-acre staging area along the edge of the Dredge Disposal Site on the landward side of the levee, between Sea Cloud Park and the southern end of Wheel House Lane, adjacent to Belmont Slough). However, because the staging areas for the proposed project could change, and other potential staging areas could also be located in areas where nearby structures are located within 5 feet, vibration impacts at the staging areas are conservatively considered significant. Therefore, the proposed project would have the potential to generate vibration to damage buildings located within 15 feet of segment 8 of the project site and within 5 feet of potential staging areas. Implementation of the following mitigation measure would require assessment and repair of building damage, thereby reducing this significant impact to a less-than-significant level.

Mitigation Measure NOISE-4b: A project contractor or other qualified professional shall be retained to prepare a vibration impact assessment (assessment) for residences located within 15 feet near levee segment 8 and within 5 feet of any potential staging area. The assessment shall take into account project-specific information such as the composition of the structures, location of the various types of equipment used during each phase of the project, and the soil characteristics in the project area, to determine whether project construction may cause damage to any of the structures located within 15 feet near levee segment 8 and within 5 feet of any potential staging area. If the assessment finds that the project may cause damage to nearby structures, the structural engineer or other qualified professional shall recommend design means and methods of construction to avoid the potential damage. The assessment and its recommendations shall be reviewed and approved by the City of Foster City. If there are no feasible design means and methods to eliminate the potential for damage, the structural engineer or other appropriate professional shall undertake an existing conditions study (study) of any structures (or, in case of large buildings, of the portions of the structures) that may experience damage. The study will establish the baseline condition of these structures, including, but not limited to, the location and extent of any visible cracks or spalls. The study shall include written descriptions and photographs. The study shall be reviewed and approved by the City of Foster City Public Works Department and/or project team. Upon completion of the project, the structures (or, in case of large buildings, of the portions of the structures) previously inspected will be resurveyed, and any new cracks or other changes shall be compared to pre-construction conditions and a determination shall be made as to whether the proposed project caused the damage. The findings shall be submitted to the City of Foster City Public Works Department and/or project team for review. If it is determined that project construction has resulted in damage to the structure, the damage shall be repaired to the pre-existing condition by the project sponsor, provided that the property owner approves of the repair. (LTS)

e. Cumulative Impacts

For noise and vibration, the geographic scope for assessing cumulative impacts is near the vicinity of the project alignment. Levee construction, in conjunction with other past, present, and reasonably foreseeable future projects, could result in a cumulative increase in noise. However, a cumulative impact related to the proposed project would occur only during construction of the levee because the noise generated during levee operation would be negligible (as discussed above) and the maintenance of the levee would not represent a source of vibration.

Noise and vibration dissipate with increased distance from the source; therefore, cumulative construction-period noise and vibration impacts would not be expected to occur unless other new sources of noise and/or vibration were located in close proximity to the levee construction project and they occurred during levee construction. Currently, there are no reasonably foreseeable projects anticipated in the vicinity of the levee alignment or proposed staging areas that would compound or increase the noise or vibration impacts resulting from project.

Additionally, since the majority of the levee construction noise generation would occur along the levee alignment itself, and these noise generating activities (including pile driving) would move along at an anticipated rate of 100 feet per day, any overlap with other construction projects would be very short-term. It is anticipated nearby receptors would be exposed to the highest level of noise generating activities (e.g., pile driving) for one or two days (and only during normal daytime working hours).

A cumulative noise impact could result if the combined traffic impact along roadways in the vicinity was great enough. However, as previously stated, due to the additive properties of noise, a doubling in traffic volumes would typically be necessary to result in a perceptible increase in noise levels (i.e., a doubling of traffic would result in a 3 dBA increase in traffic noise levels). The transportation evaluation performed for the project indicates that the increase in project-related construction traffic along nearby roadways would be negligible and thus would not make a cumulatively considerable contribution to noise levels related to traffic.

Based on the discussion above, the project's contribution to a noise impact would not be cumulatively considerable.

K. TRAFFIC AND TRANSPORTATION

This section describes the existing transportation and circulation system—including roadway, bicycle, pedestrian, and transit facilities—in the vicinity of the proposed project site (the site); discusses project construction traffic; and assesses the potential impacts of the project on the transportation system. Operation of the improved levee would generate a small number of trips related to maintenance only. Since the project would not generate a substantial number of trips, and thus would not cause transportation impacts after completion, the transportation analysis focuses solely on the impacts of the construction phase of the project.

1. Environmental Setting

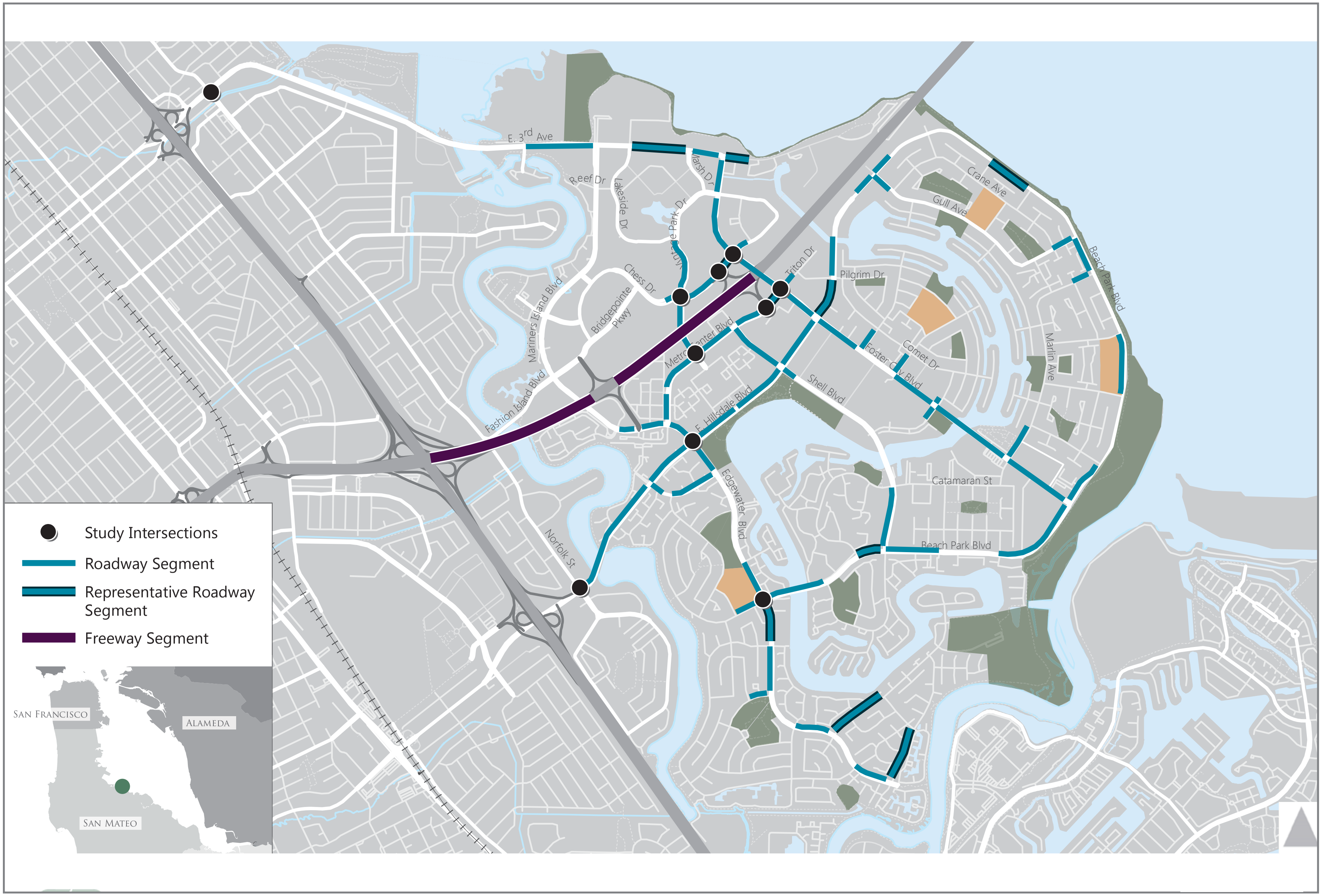
This subsection describes the existing transportation system in the vicinity of the construction staging areas and outlines the applicable transportation-related regulatory policies. Existing roadway operations are also summarized.

a. Study Locations

This study evaluates the effect of project construction on nearby roadway facilities, including 68 roadway segments and 10 intersections. The study area was selected based on local traffic patterns and engineering judgment and in consultation with City of Foster City staff. The study area is comprehensive; the effects of the project are well-contained within it and no measurable impacts are anticipated beyond these borders. The study locations are listed below and shown on Figure V.K-1. The study intersections selected were identified as operating near or over capacity in the Foster City General Plan Update EIR.[1] All study intersections are signal controlled.

Key Roadways
- East 3rd Avenue
- Foster City Boulevard
- East Hillsdale Boulevard
- Beach Park Boulevard
- Shell Boulevard
- Triton Drive
- Metro Center Boulevard
- Edgewater Boulevard
- Baffin Street

[1] City of Foster City, 2015b. *Foster City General Plan Update and Climate Action Plan Final Environmental Impact Report*. September.



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Source: Fehr & Peers, 2016

Figure V.K-1
Foster City Levee Protection Planning and Improvements Project EIR
Roadway Segments and Study Intersections

- Pitcairn Drive
- Boothbay Avenue
- Altair Avenue
- Chess Drive
- Vintage Park Drive
- Marlin Avenue
- Bounty Drive
- Polynesia Drive
- Balclutha Drive
- Gull Avenue

Study Intersections
- East 3rd Avenue/Norfolk Street
- Vintage Park Drive and Chess Drive
- Chess Drive/State Route (SR) 92 Westbound Ramps
- Chess Drive/Foster City Boulevard
- Metro Center Boulevard/Vintage Park Drive
- Metro Center Boulevard/SR 92 Eastbound Ramps
- Metro Center Boulevard/Triton Drive/Foster City Boulevard
- East Hillsdale Boulevard/Norfolk Street
- East Hillsdale Boulevard/Edgewater Boulevard
- Edgewater Boulevard/Beach Park Boulevard

Freeway Segments
- SR 92 between U.S. Highway (US) 101 and Edgewater Boulevard
- SR 92 between Edgewater Boulevard and Foster City Boulevard

b. Analysis Scenarios

This subsection presents a qualitative assessment of the potential truck volumes relative to existing traffic conditions. Construction activity would occur between the hours of 8:00 a.m. and 5:00 p.m. on weekdays unless deviations from this schedule were approved in advance by the City. The project as proposed would require an exception for non-construction activities (e.g. landscaping) to take place on Saturdays. Haul trucks would travel between a nearby quarry (i.e., Pilarcitos Quarry, which is located 12 miles away on Highway 92 near Half Moon Bay) and the construction staging areas and levee access points. Haul trucks would be required to leave the project site by 4:00 p.m. to avoid traveling during the peak evening commute period (4:00 to 6:00 p.m.) when traffic volumes are the highest. Truck trips would be added to the morning commute period but they would not be added to intersections that currently operate near or over capacity during morning peak-hour. The daily roadway segment traffic is presented for the following scenarios:

- **Existing Conditions** – Existing daily traffic volumes on the study roadway segments were collected in October and November 2015 by the City of Foster City. Existing intersection turning movement traffic volumes and traffic operations were obtained from the Foster City General Plan Update EIR. These intersection traffic counts, existing roadway/intersection configurations, and traffic operations were collected in May and September 2014 and February 2015, and verified in the field in June 2016 by Fehr & Peers.
- **Existing Plus Project Conditions** – Existing daily traffic volumes plus new truck traffic generated by the project. The project would not add truck trips during the evening commute period, and therefore would not impact evening peak-hour traffic volumes and intersection operations. Truck trips would be added to the morning commute period but not to intersections currently operating near or over capacity during the morning peak-hour.

Existing intersection operations are presented as part of the environmental setting. Cumulative conditions are not evaluated due to the short-term nature of the project. Cumulative conditions typically represent conditions 10–30 years into the future, and account for changes in traffic patterns attributed to the project and other local and regional projects as well as long-term planned transportation improvements. As presented in the *Lincoln Center Life Sciences Research Campus Project EIR*, several intersections adjacent to the Foster City Boulevard SR 92 interchange will operate unacceptably under cumulative conditions due to increases in local and regional traffic within Foster City. Since the project would not add substantial traffic to the future transportation network (beyond near-term construction traffic), alter future traffic patterns, or affect any planned transportation improvements, it would not contribute to worsening cumulative traffic conditions.

c. Analysis Methods

Evaluation of traffic conditions on local streets involves key roadway segments and intersection operations. The roadway segment assessments use 24-hour tube traffic counts collected by the City of Foster City and projected truck volumes to qualitatively describe the project's contribution to operations at roadway segments throughout Foster City. The roadway segments selected for analysis include arterial, collector, and freeway segments that provide access to the levee construction and staging areas.

Intersection operations from the Foster City General Plan Update EIR are presented to show the traffic operations at the study intersections during the periods with highest traffic volumes. Intersection operations are based on the concept of "level of service" (LOS), a qualitative description of operations ranging from LOS A (when the roadway facility has excess capacity and vehicles experience little or no delay) to LOS F (where the volume of vehicles exceeds capacity, resulting in long queues and excessive delays).

Typically, LOS E represents “at-capacity” conditions and LOS F represents “over-capacity” conditions. At signalized intersections operating at LOS F, for example, drivers may have to wait through multiple signal cycles. A description of the level of service methodology is described in detail in the Foster City General Plan Update EIR.

d. Existing Conditions

(1) Roadway Network

Regional access to the construction staging areas is provided by SR 92 and US 101. Access to SR 92 is provided via interchanges at Chess Drive/Foster City Boulevard/Metro Center Boulevard and Edgewater Boulevard/Mariners Island Boulevard/Fashion Island Boulevard. Access to US 101 is provided via interchanges at East 3rd Avenue and East Hillsdale Boulevard, and with SR 92. Key city streets used for local access include Foster City Boulevard, Vintage Park Drive, Chess Drive, Metro Center Boulevard, East Hillsdale Boulevard, Edgewater Boulevard, Shell Boulevard and Beach Park Boulevard. Speed limits on roadways in the study area range from 25 miles per hour (mph) on local streets to 35–45 mph on arterials. The speed limit is 55 mph on SR 92 and 65 mph on US 101. On-street parking is not allowed on the local roadways within the study area except where noted in the roadway descriptions below.

Regional Highways

SR 92 is a freeway that runs in an east-west direction from Half Moon Bay, near the coast, to Hayward on the east side of San Francisco Bay via the San Mateo Bridge. SR 92 has partial interchanges (hook ramps) with Chess Drive/Foster City Boulevard/Metro Center Boulevard and Edgewater Boulevard/Mariners Island Boulevard/Fashion Island Boulevard within the study area. It is generally three travel lanes in each direction east of US 101 and two travel lanes in each direction west of US 101, with auxiliary lanes between interchanges. Average daily volumes on SR 92 through the study area range from 147,000 vehicles between US 101 and Mariners Island Boulevard to 98,000 vehicles at the San Mateo Bridge.

US 101 is a freeway that provides regional north-south access along the Peninsula. In the vicinity of Foster City, US 101 typically has four travel lanes in each direction with an auxiliary lane between interchanges. Although US 101 does not run directly through Foster City, it provides the primary north-south regional access to the study area via interchanges at SR 92, East Hillsdale Boulevard, and East 3rd Avenue in the city of San Mateo. Average daily traffic volumes on US 101 through Foster City range from 233,000 vehicles at East Hillsdale Avenue to 263,000 vehicles north of SR 92.

Local Roadways

East 3rd Avenue is a four-lane divided roadway that runs in an east-west direction along the San Francisco Bay shoreline north of SR 92. It has a full access interchange with US 101 in the city of San Mateo.

Foster City Boulevard is a four- to six-lane arterial that extends from East 3rd Avenue, across SR 92, to Beach Park Boulevard. It is a major north-south arterial in Foster City. On-street parking is allowed along northbound Foster City Boulevard between Bounty Drive and approximately 450 feet south of East Hillsdale Boulevard.

Chess Drive extends eastward from Bridgepointe Parkway past Foster City Boulevard and then curves around to the north and west to intersect with Foster City Boulevard at Vintage Park Drive. Access to westbound SR 92 is provided via hook ramps just west of Foster City Boulevard. Chess Drive is four lanes wide west of Foster City Boulevard and two lanes wide to the east. On-street parking is allowed along Chess Drive to the east of Hatch Drive.

Metro Center Boulevard is a four-lane, east-west roadway that runs parallel to SR 92 to the south and extends between Edgewater Boulevard and Foster City Boulevard where it becomes Triton Drive. Access to eastbound SR 92 is provided by hook ramps just west of Foster City Boulevard.

East Hillsdale Boulevard is a four- to six-lane divided arterial that runs in an east-west direction to the south of SR 92. It has a full access interchange with US 101 in the city of San Mateo.

Beach Park Boulevard is a two- to four-lane roadway that runs along the eastern edge of Foster City until it turns into East Hillsdale Boulevard, just south of SR 92. It is a two-lane residential street west of Edgewater Boulevard with on-street parking on both sides of the street. It is a four-lane roadway east of Edgewater Boulevard with on-street parking allowed north of Foster City Boulevard.

Edgewater Boulevard is the continuation of Mariners Island Boulevard south of SR 92. It is four lanes wide with on-street parking south of East Hillsdale Boulevard.

Pitcairn Drive is a two-lane residential street that runs east-west from Sea Cloud Park to Edgewater Boulevard with on-street parking allowed on both sides of the street.

Baffin Street is a two-lane residential street that runs from Pitcairn Drive to its southerly terminus just south of Edgewater Boulevard with on-street parking allowed on both sides of the street.

Port Royal Drive is a two-lane residential street that runs from its southern intersection with Edgewater Boulevard near Port Royal Park to Edgewater Boulevard just south of Beach Park Boulevard. On-street parking is allowed on both sides of the street.

(2) Roadway Segment Volumes

Roadway segment traffic volumes were collected over 24-hour periods in October and November 2015 by the City of Foster City. The counts were conducted on non-holiday weekdays, when local area schools were in normal session. Observations were also made by Fehr & Peers during a field visit in June 2016 to confirm general roadway operations. During field visits, roadway segments were confirmed to be operating at the most congested levels during the peak periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) and outside of those peak periods, traffic levels were much lower on all study roadways. The existing roadway segment traffic volumes for the study segments are shown in Table V.K-1. The raw traffic count data are presented in Appendix F.

TABLE V.K-1 ROADWAY VOLUMES

Location	Daily Volumes	Number of Lanes
1. East 3rd Avenue between Marsh Drive and Lakeside Drive	14,160	4
2. East 3rd Avenue East of Foster City Boulevard	7,510	2
3. Foster City Boulevard between Metro Center Boulevard and E. Hillsdale Boulevard	25,800	6
4. E. Hillsdale Boulevard between Foster City Boulevard and Pilgrim Drive	12,630	4
5. Beach Park Boulevard between Egret Court and Sanderling Street	3,540	4
6. Beach Park Boulevard between Shell Boulevard and Catamaran Street	9,620	4
7. Metro Center Boulevard between Foster City Boulevard and CA-92 On/Off Ramp	24,570	5
8. Edgewater Boulevard between Beach Park Boulevard and Port Royal Avenue (North)	18,790	4
9. Baffin Street between Edgewater Boulevard and Melbourne Street	980	2
10. Pitcairn Drive between Edgewater Boulevard and Melbourne Street	4,860	2
11. Chess Drive between CA-92 On/Off Ramp and Foster City Boulevard	26,600	6

Source: City of Foster City, 2015.

In addition, annual average daily traffic volumes were collected on two freeway segments from Caltrans' Traffic Census Program. 2014 volumes for SR 92 between US 101 and Edgewater Boulevard and between Edgewater Boulevard and Foster City Boulevard are summarized in Table V.K-2.

TABLE V.K-2 FREEWAY VOLUMES

Location	Annual Average Daily Traffic (2014)[a]
1. SR 92 between US 101 and Edgewater Boulevard	147,000
2. SR 92 between Edgewater Blvd and Foster City Boulevard	124,000

[a] Annual average daily traffic 2014 counts represent the most recently available data from Caltrans.
Source: Caltrans, 2014.

(3) Intersection Traffic Volumes and Operations

Intersection turning movement counts were conducted at the study intersections during the morning and evening peak periods (7:00 to 9:00 a.m. and 4:00 to 6:00 p.m.) in May and September 2014 and February 2015 by Fehr & Peers. The counts were conducted on non-holiday weekdays, when local area schools were in normal session. Intersection lane configurations and traffic control devices (traffic signals) were confirmed during field visits in June 2016. The existing morning and evening peak-hour traffic demand volumes, lane geometries, and intersection controls for the study intersections are presented in Appendix F.

Intersection Operations

The intersection level of service analysis results for the study intersections are shown in Table V.K-3. The level of service analysis for these intersections was developed as part of the Foster City General Plan Update EIR. The level of service analysis results for the four intersections near the SR 92/Foster City Boulevard interchange are based on simulation results from the VISSIM micro-simulation model, while the remaining study intersections were analyzed as isolated intersections based on the 2000 Highway Capacity Manual method using the Traffix analysis software.

The level of service results show that all of the intersections currently operate at an acceptable LOS D or better, except for Norfolk Street/East 3rd Avenue in the morning peak hour and Foster City Boulevard/Chess Drive in the evening peak hour, both of which operate at LOS E. The level of service calculations for the study intersections are included in Appendix F. Field observations in June 2016 confirmed that existing intersection operations during the peak hours matched the traffic operations from the Foster City

TABLE V.K-3 EXISTING INTERSECTION LEVEL OF SERVICE

		AM		PM	
Intersection	**Control**	**Delay[a]**	**LOS**	**Delay[a]**	**LOS**
1. East 3rd Avenue and Norfolk Street[b]	Signal	**56**	**E**	43	D
2. Vintage Park Drive and Chess Drive	Signal	29	C	44	D
3. SR 92 WB Ramps and Chess Drive[c]	Signal	21	C	23	C
4. Foster City Boulevard and Chess Drive[c]	Signal	26	C	**75**	**E**
5. Vintage Park Drive and Metro Center Boulevard	Signal	35	D	38	D
6. SR 92 EB Ramps and Metro Center Boulevard[c]	Signal	17	B	29	C
7. Foster City Boulevard and Metro Center Boulevard/Triton Drive[c]	Signal	29	C	34	C
8. Norfolk Street and East Hillsdale Boulevard[b]	Signal	40	D	38	D
9. Edgewater Boulevard and East Hillsdale Boulevard	Signal	32	C	36	D
10. Foster City Boulevard and East Hillsdale Boulevard	Signal	30	C	25	C
11. Edgewater Boulevard and Beach Park Boulevard	Signal	54	D	37	D

Notes: SSS = Side-street stop, AWS = All-way stop, WB = westbound, EB = eastbound
Bold = Exceeds LOS D
[a] For signalized and all-way stop-controlled intersections, the delay shown is the weighted average for all movements in seconds per vehicle. For side-street stop-controlled intersection, the delay shown is the worse approach delay.
[b] Study intersection is in San Mateo.
[c] Intersections analyzed using the VISSIM microsimulation model.
Source: Fehr & Peers, February 2015.

General Plan Update EIR. Traffic operations at these study intersections were observed to operate acceptably outside of peak traffic periods, during the periods that construction traffic would mostly travel through these intersections.

(1) Transit System

Transit service within Foster City is provided by several agencies. San Mateo County Transit District (SamTrans) and Alameda-Contra Costa Transit District (AC Transit) provide bus service, while the Peninsula Traffic Congestion Relief Alliance operates shuttle routes connecting to Bay Area Rapid Transit (BART) and Caltrain stations. Figure V.K-2 illustrates the transit routes in the vicinity of the construction staging areas. Descriptions of these routes, the hours of operation, and their service headways (time between arrivals) are described below and summarized in Table V.K-4.

TABLE V.K-4 EXISTING TRANSIT SERVICE

Service Provider	Name/Description	Hours of Operation/Headway
SamTrans	251 – Caltrain Connection	11:30 a.m. – 8:17 p.m. Weekdays (60 minutes) 8:30 a.m. – 7:20 p.m. Saturdays (120 minutes)
	256 – Caltrain Connection	6:34 a.m. – 5:25 p.m. Weekdays (60 minutes) 7:30 a.m. – 8:18 p.m. Saturdays (120 minutes)
	54 – School Service	7:39 a.m. – 8:05 a.m. Weekdays (one bus) 1:50 p.m. – 3:40 p.m. Weekdays (six buses)
	57 – School Service	6:50 a.m. – 7:20 a.m. Weekdays (one bus) 2:10 p.m. – 4:02 p.m. Weekdays (two buses)
AC Transit	M – Transbay Service	5:57 a.m. – 6:53 p.m. Weekdays (40 minutes)
BART/Caltrain Shuttle	Foster City - North	6:35 a.m. – 10:02 a.m. Weekday (30 minutes) 4:04 p.m. – 7:18 p.m. Weekday (30 minutes)
Caltrain Shuttle	Foster City – Lincoln Centre	7:00 a.m. – 9:40 a.m. Weekday (45 minutes) 3:08 p.m. – 7:05 p.m. Weekday (40 minutes)
	San Mateo – Mariners Island	7:00 a.m. – 10:25 a.m. Weekday (45 minutes) 3:12 p.m. – 6:39 p.m. Weekday (45 minutes)

Source: SamTrans, AC Transit, 2016. Peninsula Traffic Congestion Relief Alliance. http://www.commute.org/, accessed June 16.

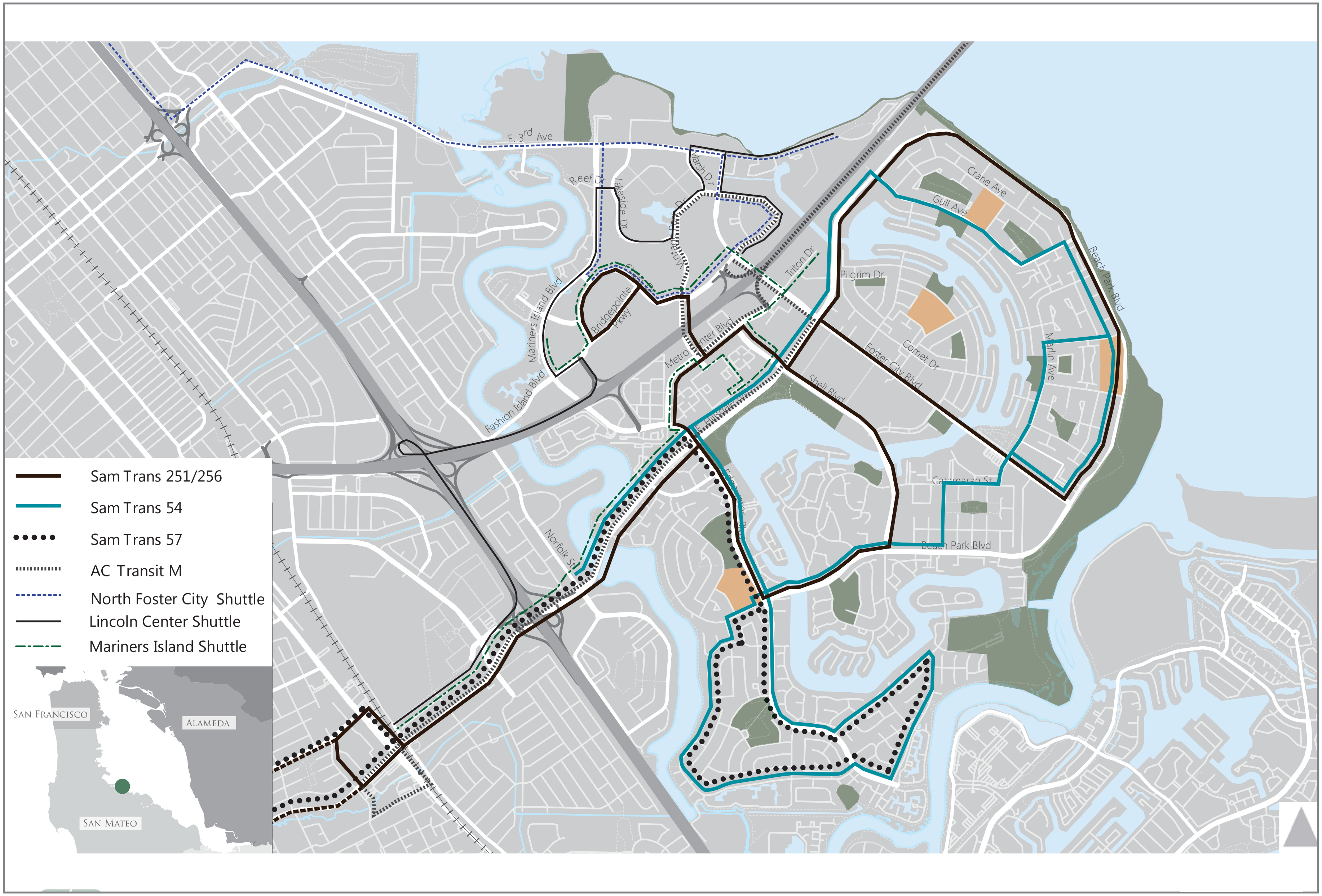
SamTrans

SamTrans operates Route 251, Route 256, Route 54, and Route 57 in Foster City. Route 251 provides a connection between the Hillsdale Shopping Center and Hillsdale Caltrain station in San Mateo to Foster City and the Bridgepointe Shopping Center in San Mateo. Route 256 operates along the same route as Route 251, but in the opposite direction for the loop within Foster City. Routes 54 and 57 serve the weekday morning and afternoon school commute to/from Bowditch Middle School and Hillsdale High School in San Mateo and Foster City, respectively.

In addition to its traditional bus routes, SamTrans runs paratransit service for persons with disabilities through its Redi-Wheels program. The Foster City Parks & Recreation Department's Senior Express Shuttle also operates on-demand service for Foster City residents who are 50 years and over.

AC Transit

AC Transit provides Transbay service between Hayward and San Mateo. Line M operates across the San Mateo Bridge/SR 92 and travels on Foster City Boulevard, Chess Drive, Vintage Park Drive, Metro Center Boulevard, and E. Hillsdale Boulevard in Foster City.



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Source: Fehr & Peers, 2016

Figure V.K-2
Foster City Levee Protection Planning and Improvements Project EIR
Existing Transit Facilities

BART/Caltrain Shuttle

The Foster City – North BART/Caltrain Shuttle provides service operated by the Peninsula Traffic Congestion Alliance between the Millbrae Intermodal Station and businesses and office buildings in the North Foster City Area during commute hours, Monday through Friday.

Caltrain Shuttles

The Peninsula Traffic Congestion Relief Alliance operates two other shuttle buses during weekday commute hours: Foster City – Lincoln Centre Shuttle and San Mateo – Mariners Island Shuttle. The Lincoln Centre Shuttle runs between the Hillsdale Caltrain Station and businesses in the Lincoln Centre Area in North Foster City, whereas the Mariners Island Shuttle provides service between the Hillsdale Caltrain Station and businesses in the San Mateo and Foster City border areas.

(2) Bicycle System

Bicycle facilities include Class I multi-use paths, Class II bike lanes, and Class III bike routes. Class I multi-use paths are paved pathways that are separated from roadways by space or a physical barrier. Class II bike lanes are lanes on the outside edge of roadways that are intended for the exclusive use of bicycles and are designated with special signing and pavement markings. Class III bike routes are roadways designated for bicycle use with only a bike route sign.

The bicycle facilities in Foster City are shown on Figure V.K-3. Class I bicycle paths are provided near and along the bay shoreline as part of the Bay Trail. Class II bike lanes run along Mariners Island Boulevard, Norfolk Street, Bridgepointe Circle, and Bridgepointe Parkway. Class III bicycle routes are located on Foster City Boulevard, Vintage Park Drive, East 3rd Avenue, Lakeside Drive, Metro Center Boulevard, Shell Boulevard, and East Hillsdale Boulevard. The project includes temporary relocation and reconstruction of the Class I bicycle path along the Foster City levee.

(3) Pedestrian Facilities

Pedestrian facilities comprise sidewalks, off-street pathways, marked and enhanced crosswalks (at midblock and intersections), curb ramps, median refuges, and pedestrian-scale lighting. Sidewalks are provided along both sides of many streets within Foster City, with marked crosswalks and curb ramps at intersections. One exception is along East 3rd Avenue, which has sidewalks only on the south side of the street. A segment of the Bay Trail, which includes a Class I multi-use pathway, provides pedestrian access along the bay shoreline just north of East 3rd Avenue. At smaller intersections where a local street meets a main arterial, such as the intersection of Foster City Boulevard/Polynesia Drive,

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Source: Fehr & Peers, 2016

Figure V.K-3
Foster City Levee Protection Planning and Improvements Project EIR
Existing Bicycle and Pedestrian Facilities

marked crosswalks rarely exist and traffic is often uncontrolled on the larger roadway. Pedestrian signals with pedestrian activated push buttons are provided at signalized intersections. Medians are often present on the wide boulevards, but median curb cuts are rarely provided for pedestrian refuge. The project includes temporary relocation and reconstruction of the multi-use pathway (Bay Trail) along the Foster City levee.

e. Regulatory Framework

State and local laws, regulations, and orders that pertain to transportation and traffic resources in the project area are presented below.

(1) Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) is the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area (Bay Area). It is responsible for developing the regional transportation plan and prioritizing regional transportation projects for state and federal funding.

(2) City/County Association of Governments of San Mateo County

The City/County Association of Governments (C/CAG) of San Mateo County is the County's Congestion Management Agency. It prepares a Congestion Management Plan (CMP), which identifies improvements and strategies to relieve congestion on regional transportation facilities, and sets funding priorities. The CMP is required to be consistent with the MTC planning process and projects for the Regional Transportation Improvement Program. C/CAG also provides guidelines for the analysis of land use projects and their impacts to the designated CMP roadway system.

The San Mateo County CMP roadway system comprises 53 roadway segments and 16 intersections. The CMP facilities in Foster City include US 101 and SR 92. The level of service standards for these facilities vary by roadway segment:

- SR 92 from US 101 to Alameda County Line, LOS E
- US 101 from Peninsula Avenue to SR 92, LOS F
- US 101 from SR 92 to Whipple Road, LOS E

(3) California Department of Transportation

The California Department of Transportation (Caltrans) is responsible for the maintenance and operation of state routes and highways. In Foster City, Caltrans facilities include SR 92 and US 101. Caltrans maintains a volume monitoring program and reviews local agencies' planning documents (such as this EIR) to assist in its forecasting of future volumes and congestion points. The *Guide for the Preparation of Traffic Impacts Studies* published by Caltrans[2] is intended to provide a consistent basis for evaluating traffic impacts to State facilities. The City recognizes that "Caltrans endeavors to maintain a target level of service at the transition between LOS C and LOS D on State highway facilities;" however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target level of service.

In addition, Caltrans states that, for existing state highway facilities operating at less than the target level of service, the existing level of service should be maintained.

(4) San Mateo County Transportation Authority

The San Mateo County Transportation Authority was formed in 1988. The authority administers the proceeds from Measure A, the voter approved half-cent sales tax, to fund a variety of transportation-related projects and programs. The San Mateo County Transportation Authority projects in the vicinity of Foster City include auxiliary lanes on US 101.

(5) Foster City General Plan

All cities in California are required to prepare and adopt a General Plan. The General Plan presents the community's long-range view regarding its physical development. Specifically, it contains goals, policies, and programs addressing the development and redevelopment of land, preservation of parks and open spaces, provision of housing, conservation of natural resources, improvement of the transportation system, control of noise, and protection from hazards.

The Land Use and Circulation Element of the Foster City General Plan was adopted in February 2016. The applicable circulation goals, policies, and programs related to transportation impacts related to the construction of the project are as follows:

> *Goal LUC-E: Provide for Diversified Circulation Needs.* Develop, improve and maintain a circulation system, which provides efficient and safe access for private vehicles, commercial vehicles, public transit, emergency vehicles, bicycles and pedestrians.
>
> *Goal LUC-F: Maintain Acceptable Operating Conditions on the City's Road Network.* Maintain acceptable operating conditions on the City's road network at or above LOS D, or equivalent measurement, and encourage the maximum effective use of public and private vehicles, reduce the growth in peak hour traffic volumes and reduce single passenger trips.

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[2] Caltrans, 2002. *Guide for the Preparation of Traffic Impacts Studies.* December.

Goal LUC-G: Provide Adequate Parking. Ensure that adequate off-street parking is incorporated into new and modified projects, and designed for safe and effective circulation.

Goal LUC-H: Foster a More Sustainable Community. Strive to be a community that meets the needs of the present without compromising the ability of future generations to meet their own needs by promoting land use strategies that decrease reliance on automobile use, increase the use of alternative modes of transportation, maximize efficiency provision of services and reduce emissions of GHGs.

Goal LUC-L: Provide Adequate Services and Facilities. Ensure that new and existing developments can be adequately served by municipal services and facilities.

Policy LUC-E-1: Improvements to Existing Streets. The City will maintain and improve the existing system of major and collector streets.

Policy LUC-E-2: Complete Streets. The City will plan for a balanced, multimodal transportation network that meets the needs of all users of the streets, roads, and highways for safe and convenient travel.

Policy LUC-E-3: Streets in Residential Neighborhoods. Residential neighborhoods shall be protected from through traffic by maintaining the system of narrower collector and local streets and minimizing the number of through streets. To accomplish this, the City may consider other traffic calming techniques.

Policy LUC-E-4: Private Streets and Public Loop or Cul-de-Sac Streets. The City will enforce design standards for private streets and public loop or cul-de-sac streets to ensure that they meet minimum requirements for two-way traffic, parking, and emergency access. Private streets and public loop or cul-de-sac streets may be approved with narrower than standard widths, provided that emergency access and parking can be safely accommodated. They are not intended to provide curbside parking, and the roads are designed to serve only those residences on that street or within that development.

LUC-E-6: Create Opportunities for Transit Access. Create opportunities to improve transit and access to regional transit with new or modified development, as appropriate.

LUC-E-7: Coordination with Transit Agencies that Serve San Mateo County. The City shall work with SamTrans, Alameda-Contra Costa Transit District (AC Transit), the Peninsula Traffic Congestion Relief Alliance, RIDES and other agencies that serve San Mateo County in defining new transit routes and improving the public transit and transportation system.

LUC-E-8 Pedestrian, Bicycle and Neighborhood Electric Vehicle (NEV) Friendly Design. Encourage bicycling, walking and use of NEVs instead of driving automobiles to reduce greenhouse gas emissions, save money on fuel and maintenance, and foster a healthier population. Prioritize pedestrian and bicycle-friendly improvements including bike lanes on main streets, an urban bike-trail system, bike parking, pedestrian crossings, and associated master plans with new or modified development, as appropriate.

LUC-E-9: Bicycle Routes and Pedestrian Paths. Maintain a system of bicycle routes and pedestrian paths, which will include separate bicycle lanes and posted bicycle routes. Pedestrian pathways and easements shall be maintained, either by the City, or, in the case of private ownership, according to a maintenance agreement or landscaping district agreement applicable to the pathway/easement.

LUC-F-1: Traffic Level of Service Standards. The City shall seek to achieve a traffic service level of "C" or better on City streets and level of "D" or better during peak traffic hours, although it will be necessary to accept level of service "E" or "F" at the SR 92 Westbound Ramps/Chess Drive, the Foster City Blvd./Metro Center Blvd./Triton Drive, Vintage Park Drive/Chess Drive, and the Foster City Boulevard/Chess intersections due to their role as access points to the freeway system. The level of service standard will be maintained through the following means:

a. Intelligent Transportation Systems (ITS)
b. Transportation Demand Management (TDM) for development projects
c. Capital Improvement Program and coordination with federal, state, county and district funding programs for street and other transportation improvements.
d. Developer payment of pro rata fair share of traffic improvement costs for new developments.

LUC-G-2: Preferred Parking/Electric Plug-in. Encourage businesses, developers, and property managers to create preferred parking for electric and alternative fuel vehicles and study the installation of electric charging stations for plug-in vehicles.

LUC-G-3: Off-Street Parking Requirements. The City shall maintain off-street parking requirements based on use permits of record, the historical parking patterns of residential and non-residential projects, and related information developed by the Urban Land Institute, Institute of Traffic Engineers, or other reliable sources.

LUC-H-2: Reduce GHG Emissions. The City will strive to reduce GHG emissions by reducing vehicle miles traveled by supporting trip reduction programs and encouraging the use of alternative fuels and transportation technologies.

(6) City of San Mateo 2030 General Plan

The City of San Mateo General Plan was also reviewed, as segment 1 and part of the bicycle construction detour route is located within the City of San Mateo. The City of San Mateo completed its 2030 General Plan Update in 2010. The applicable circulation goals, policies, and programs related to transportation impacts are as follows:

Goal 2: Maintain a street and highway system which accommodates future growth while maintaining acceptable levels of service.

Policy C2.1: Acceptable Levels of Service. Maintain a Level of Service no worse than mid LOS D, average delay of 45.0 seconds, as the acceptable Level of Service for all intersections within the City.

Policy C 2.7: Exceeding the Acceptable Level of Service. In addition to paying the transportation impact fee, a development project may be required to fund off-site circulation improvements which are needed as a result of project generated traffic, if:

a. The Level of Service at the intersection drops below mid-level LOS D (average delay of more than 45 seconds) when the project traffic is added, and
b. An intersection that operates below its level of service standard under the base year conditions experiences an increase in delay of four or more seconds, and
c. The needed improvement of the intersection(s) is not funded in the applicable 5-year City Capital Improvement Program from the date of application approval.

(7) Intersection Operations Thresholds

Based on the state and local laws, regulations, and ordinances presented above, acceptable level of service thresholds were determined for the purpose of this study. As shown in Table V.K-5, the City of Foster City seeks to achieve traffic service of level D or better at all study intersections during peak traffic hours,[3] and the City of San Mateo seeks to achieve a mid-range LOS D or better (defined as an average of 45 seconds of delay per vehicle).[4] Therefore, an increase in vehicular traffic delay at each of the study intersections would be considered significant if it causes the peak-hour level of service to drop to LOS E or F, or if the intersection is already operating at LOS E or F, causes an increase of 4 or more seconds of average delay.

Table V.K-5 Locally-Acceptable Intersection Level of Service Criteria

Jurisdiction	Facility Type	Worst Acceptable LOS	Maximum Acceptable Average Vehicular Delay or V/C Ratio
City of Foster City	Signalized Intersections	LOS D[a]	55 seconds/vehicle[b]
City of Foster City	Unsignalized Intersections	LOS D	35 seconds/vehicle[b]
City of San Mateo	Signalized Intersections	Mid-range LOS D	45 seconds/vehicle[b]

[a] The Foster City General Plan Land Use and Circulation Policy LUC-F-1 states that it will be necessary to accept LOS E or F at the following intersections: SR 92 Westbound Ramps/Chess Drive, Foster City Blvd./Metro Center Blvd./Triton Drive, Vintage Park Drive/Chess Drive, and Foster City Boulevard/Chess Drive due to their role as access points to the freeway system.
[b] Based on 2000 Highway Capacity Manual.
[c] LOS F is considered acceptable on US 101 north of SR 92 to Peninsula Avenue due to existing congestion levels.
Source: City of Foster City General Plan, City of San Mateo General Plan.

[3] City of Foster City, 2016. *General Plan, Chapter 3: Land Use and Circulation Element Update.*
[4] City of San Mateo, 2010. *General Plan.*

2. Impacts and Mitigation Measures

This subsection discusses the potential impacts related to traffic and transportation that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the traffic and transportation impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts.

a. Significance Criteria

The criteria for evaluating the significance of a project's environmental impacts are based on the CEQA Guidelines and applicable standards recognized by Foster City, San Mateo, and C/CAG. For this analysis, transportation impacts are considered significant if the project would:

- Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Transit impacts would be considered significant if the project would:

- Disrupt existing transit services or facilities. This includes disruptions caused by project access points or staging areas near streets used by transit, and impacts to transit stops/shelters;
- Interfere with planned transit services or facilities; or

- Conflict or create inconsistencies with adopted transit system plans, guidelines, policies, or standards.

Bicycle and pedestrian impacts would be considered significant if the project would:

- Disrupt existing or planned bicycle or pedestrian facilities; or
- Create inconsistencies with adopted bicycle or pedestrian system plans, guidelines, or policy standards.

b. Project Characteristics

This subsection describes the project being analyzed in this study and the process used to develop the project travel patterns.

(1) Project Description

The project includes construction of an upgraded perimeter levee wall that protects Foster City and parts of San Mateo. For the purposes of the transportation analysis, this document presents the effects of the 2100 Sea Level Rise scenario only. This scenario generates the most truck trips, and therefore represents the most conservative assessment of transportation system impacts. The project itself will not generate a substantial number of trips or alter transportation circulation patterns upon completion; however, it will generate temporary construction traffic. The project is divided into five phases, with each phase focusing on a particular section(s) of the levee. Truck routing assumptions prepared as part of the project describes the truck haul routes, the types of trucks used during the construction process, and the hours the trucks will be operating on the roadways.[5] Twenty-ton trucks would transport fill material from a nearby quarry to specified staging areas located near levee access points. Ten-ton trucks would then transport fill material between the staging area and levee access points and along the levee itself.

In addition, no more than 20 workers would travel to/from the project sites at one time during the construction period. This number of construction workers includes the drivers of haul trucks. Construction workers in private vehicles would likely arrive just before and leave shortly after the hours of construction (8:00 a.m. to 5:00 p.m.). The number of vehicles associated with construction workers traveling to/from the project site and/or staging areas during the morning peak period (7:00 a.m. to 9:00 a.m.) and evening peak period (4:00 p.m. to 6:00 p.m.) would be very small and within the expected daily fluctuation of traffic. Vehicle trips associated with construction workers are not expected to substantially affect peak hour intersection operations.

[5] Schaaf & Wheeler, 2016. Foster City Levee EIR Truck Routing Assumptions. May.

(2) Construction Traffic Trip Generation

Construction trip estimates for the project were developed by calculating the number of construction truck trips required to haul the needed fill material to upgrade the levee. Based on bulk and compacted fill volumes provided by Schaaf & Wheeler,[6] the total number of 20-ton and 10-ton trucks was calculated by phase. Daily truck trips were estimated based on construction duration by phase and standard construction work schedules provided for this project.

The project is anticipated to generate 46 daily truck trips on average, but the number of daily truck trips would vary between construction phases. For example, Phase 3 would generate 142 daily truck trips in Foster City while Phase 4 would generate 19 truck trips per day. Detailed construction trip assumptions and calculations are presented in Appendix F.

(3) Construction Traffic Trip Distribution and Assignment

Trip distribution refers to the directions the construction trips generated by the project would use to approach and depart the staging areas and access sites.

The construction trips were distributed and assigned along roadway segments based on designated truck haul routes, as shown on Figure V.K-4. Truck haul routes were determined based on roadway capacity, safety, accessibility, and were selected in consultation with Foster City Public Works staff. Table V.K-6 summarizes the truck trip generation and assignment on the most constrained roadway segments for each study roadway segment. All roadway segments are presented in Appendix F.

c. Existing Plus Project Conditions

This subsection presents the results of the roadway segment assessment for Existing Plus Project Conditions. Existing Conditions form the baseline against which project-related impacts are evaluated.

(1) Roadway Segment Analysis

Existing daily traffic volumes on key roadway segments in Foster City are summarized in Table V.K-1. Construction truck traffic would represent less than 1.6 percent of daily traffic volumes on any one roadway segment in Foster City, while the vast majority of segments would experience less than a 0.5-percent increase due to construction trucks.

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[6] Schaaf & Wheeler, 2016, op cit.

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Source: Fehr & Peers, 2016

Figure V.K-4
Foster City Levee Protection Planning and Improvements Project EIR
Staging Areas and Truck Haul Routes

TABLE V.K-6 TRUCK TRIP GENERATION BY CONSTRUCTION PHASE

Location	Existing Daily Traffic Volumes	Truck Trips Added Per Day Per Phase				
		1	2	3	4	5
1. East 3rd Avenue between Marsh Drive and Lakeside Drive	14,160	0	0	0	0	12
2. East 3rd Avenue east of Foster City Boulevard	7,510	0	0	0	0	121
3. Foster City Boulevard between Metro Center Boulevard and E. Hillsdale Boulevard	25,800	21	0	48	0	0
4. E. Hillsdale Boulevard between Foster City Boulevard and Pilgrim Drive	12,630	21	0	48	0	0
5. Beach Park Boulevard between Egret Court and Sanderling Street	3,540	21	0	24	0	0
6. Beach Park Boulevard between Shell Boulevard and Catamaran Street	9,620	0	18	0	0	0
7. Metro Center Boulevard between Foster City Boulevard and CA-92 On/Off Ramp	24,570	21	0	24	0	20
8. Edgewater Boulevard between Beach Park Boulevard and Port Royal Avenue (North)	18,790	0	27	0	6	0
9. Baffin Street between Edgewater Boulevard and Melbourne Street	980	0	1	0	0	0
10. Pitcairn Drive between Edgewater Boulevard and Melbourne Street	4,860	0	29	0	8	0
11. Chess Drive between CA-92 On/Off Ramp and Foster City Boulevard	26,600	10	0	24	0	20
12. SR 92 between US 101 and Edgewater Boulevard	147,000	21	10	48	6	40
13. SR 92 between Edgewater Blvd and Foster City Boulevard	124,000	21	0	48	0	40
Max. Daily Truck Trips Added[a]		**21**	**29**	**48**	**8**	**121**

[a] Most truck trips uses multiple segments to travel to and from the destinations. Therefore, the maximum number of trips under any one segment during the construction phase is shown here to represent the busiest segment.
Source: Foster City, 2015; Fehr & Peers, 2016.

Added truck trips are summarized in Table V.K-7, which shows the maximum number of daily truck trips added and the phase in which this maximum number of truck trips is observed. Based on the project's truck trip assumptions, truck trips would be evenly distributed during weekdays between 8:00 a.m. and 4:00 p.m., and would not represent a substantial increase to daily traffic volumes on key roadway segments. Therefore, all construction truck trips would be added to the roadway segments outside of the peak evening traffic period, and would result in minor effects on the roadway network. During the morning peak period, construction trucks would not be added to any intersection that currently operates near or

TABLE V.K-7 EXISTING ROADWAY VOLUMES AND ADDED TRUCK TRIPS

Location	Volumes	Maximum Daily Truck Trips Added	Percent Change	Phase of Maximum Daily Truck Trips
1. East 3rd Avenue between Marsh Drive and Lakeside Drive	14,160	12	0.1%	Phase 5
2. East 3rd Avenue east of Foster City Boulevard	7,510	121	1.6%	Phase 5
3. Foster City Boulevard between Metro Center Boulevard and E. Hillsdale Boulevard	25,800	48	0.2%	Phase 3
4. E. Hillsdale Boulevard between Foster City Boulevard and Pilgrim Drive	12,630	48	0.4%	Phase 3
5. Beach Park Boulevard between Egret Court and Sanderling Street	3,540	24	0.7%	Phase 3
6. Beach Park Boulevard between Shell Boulevard and Catamaran Street	9,620	18	0.2%	Phase 3
7. Metro Center Boulevard between Foster City Boulevard and CA-92 On/Off Ramp	24,570	24	0.1%	Phase 3
8. Edgewater Boulevard between Beach Park Boulevard and Port Royal Avenue (North)	18,790	27	0.1%	Phase 2
9. Baffin Street between Edgewater Boulevard and Melbourne Street	980	1	0.1%	Phase 2
10. Pitcairn Drive between Edgewater Boulevard and Melbourne Street	4,860	29	0.6%	Phase 2
11. Chess Drive between CA-92 On/Off Ramp and Foster City Boulevard	26,600	24	0.1%	Phase 3
12. SR 92 between US 101 and Edgewater Boulevard	147,000	48	0.0%	Phase 3
13. SR 92 between Edgewater Boulevard and Foster City Boulevard	124,000	48	0.0%	Phase 3

Source: City of Foster City, 2015; Schaaf & Wheeler, Fehr & Peers, 2016.

over capacity during the peak morning commute period. In addition, the construction activities would be temporary. Therefore, impacts to the roadway system would be less than significant.

(2) Intersection Operations

Some of the study intersections presented in Table V.K-3 operate at or near capacity under existing conditions, especially during the evening peak hour. As presented above, daily construction truck traffic would not account for a substantial amount of traffic at roadway segments adjacent to these intersections. During the morning peak period, construction truck traffic would not be added to intersections that are currently operating near or over capacity. Further, construction traffic would leave the construction area by 4:00 p.m. on weekdays based on the project's truck routing assumptions. Therefore, construction traffic would not worsen average vehicle delay and level of service during peak evening hours. Therefore, impacts to study intersections are anticipated to be less than significant.

(3) Pedestrian and Bicycle Facilities

Upon completion, the project would not result in any increased pedestrian or bicycle activity nor would it alter pedestrian or bicycle paths through Foster City. However, during construction of the project, sections of the Bay Trail (Class I shared multi-use path) would be temporarily closed.

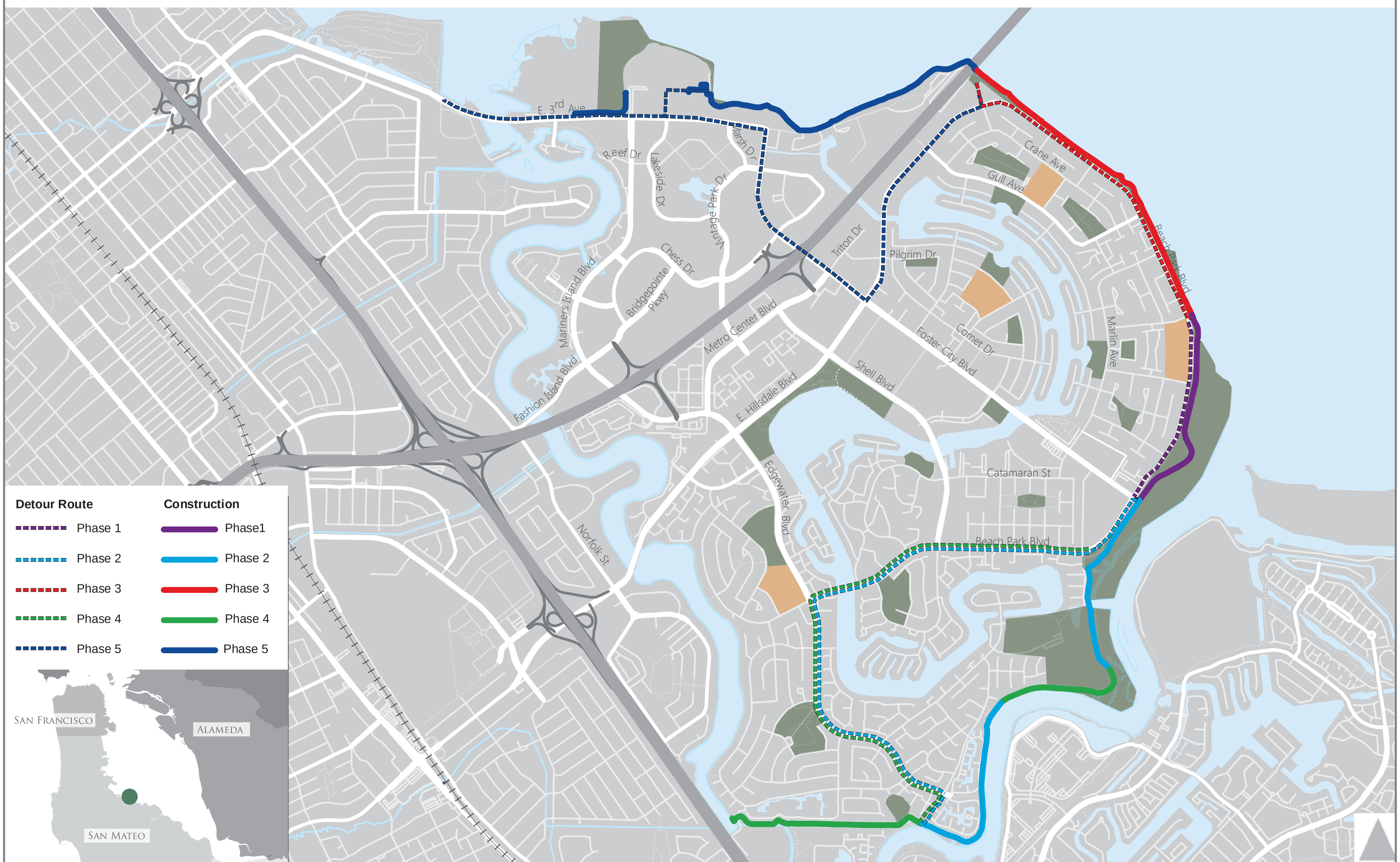
Impact TRANS-1: The Levee project would temporarily disrupt pedestrian and bicycle facilities. (S)

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level:

Mitigation Measure TRANS-1: The Levee project shall include a Bay Trail closure plan prepared by the project contractor and reviewed by the City of Foster City Public Works Department and/or the project team that includes recommended detour routes, appropriate signage and striping, and public outreach strategies, as detailed in this section for each phase of construction. The Bay Trail closure plan shall be consistent with the standards and guidelines listed below, including the 2014 California MUTCD, the San Mateo County Resource Guide, the Bicycle Technical Guidelines, and Caltrans Standards. Additionally, the closure plan shall include a plan for Memorial Benches currently located along the Bay Trail that would include either re-locating or placing them in the same location (depending on final design details and final wall heights).

Recommended Bay Trail detour routes are shown on Figure V.K-5 for each phase of construction.[7] Detours shall be determined to maintain connectivity of the Bay Trail through Foster City during construction while focusing on user safety. A Construction Management Plan shall also be submitted to the City of Foster City Public Works Department for review and approval prior to the start of construction and shall require construction and haul trucks to leave the project site by 4:00 p.m. on weekdays to avoid traveling during the peak evening commute period (4:00 to 6:00 p.m.) when traffic volumes are the highest. If the project schedule is reduced below the shortest anticipated schedule (1.5 years for the 2050 Sea Level Rise scenario and 2 years for

[7] Detour routes are the same under the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios; however, the number of construction phases would change from four to five phases, respectively.



Source: Fehr & Peers, 2016

Figure V.K-5
Foster City Levee Protection Planning and Improvements Project EIR
Bay Trail Detour Routes

the 2100 Sea Level Rise scenario) the contractor shall submit a final construction-phasing plan to the City of Foster City Public Works Department and/or the project team for review prior to the start of construction.

The Bay Trail closure plan shall be implemented and monitored by the project contractor with oversight by the City of Foster City Public Works Department and/or the project team. The closure plan shall comply with 2014 California Manual on Uniform Traffic Control Devices[8], which provides standards, guidance, and support for bicycle considerations as part of the temporary traffic control during construction periods. Applicable standards and recommendations for bicycle and pedestrian detour routes include:

- Bicyclists shall not be led into direct conflicts with mainline traffic, work site vehicles, or equipment moving through or around the temporary traffic control zone (Section 6D.101(CA)-01-E).
- Each detour shall be adequately marked with standard temporary route signs and destination signs (Section 6F.59-01).
- If used, the Pedestrian/Bicycle Detour sign shall have an arrow pointing in the appropriate direction (Section 6F.59-11).
- Where pedestrian routes are closed, alternate pedestrian routes shall be provided (Section 6G.05-08).
- When existing pedestrian facilities are disrupted, closed, or relocated in a temporary traffic control zone, the temporary facilities shall be detectable and shall include accessibility features consistent with the features present in the existing pedestrian facility (Section 6G.05-09).
- When the roadway width is inadequate for allowing bicyclists and motor vehicles to travel side by side, warning signs shall be used to advise motorists of the presence of bicyclists in the travel way lanes (Section 6D.101(CA)-01-D).
- Bicyclists and pedestrians shall not be exposed to unprotected excavations, open utility access, overhanging equipment, or other such conditions (Section 6G.05-05).
- When existing accommodations for bicycle travel are disrupted or closed in a long-term duration project, appropriate information and devices shall be used in order to replicate existing conditions for the needs and control of bicyclists through a temporary traffic control zone (Section 6G.05-06a).

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[8] California Manual on Uniform Traffic Control Devices 2014 Edition (Federal Highway Administration's MUTCD 2009 Edition, including Revisions 1 & 2, as amended for use in California). Part 6: Temporary Traffic Control.

- The closure plan shall be monitored and implemented by the city and shall also follow additional guidance provided by the San Mateo County Resource Guide for the Education, Funding and Design of Pedestrian and Bicycle Facilities[9] and the Bicycle Technical Guidelines[10] prepared by the Santa Clara Valley Transportation Authority (VTA). The San Mateo County Resource Guide and VTA Bicycle Technical Guidelines reference the Manual on Uniform Traffic Control Devices and Caltrans standards as well as provide best practices.
- Long detour routing shall be avoided because of lack of compliance.
- Bicycle detour signs shall be used where a pedestrian/bicycle detour route has been established because of the closing of a bicycle facility to through traffic. Advance warning of the detour shall be placed at appropriate locations and clear wayfinding shall be implemented to enable bicyclists to continue safe operation along travel corridor.
- If the detour route for the pedestrian detour is the same as for the bicycle detour, then the combination pedestrian/bicycle detour sign (M4-9a) may be used. The City shall approve a contractor prepared detour plan.
- Post a sign giving bicyclists advance notice of all bike path closures and of all other detours of more than 0.5 mile. Two weeks' notice of path and roadway closures is recommended.
- A schematic of the detour route shall be posted at the beginning of the detour if the detour route is complex or there are a lot of non-local users of the facility (e.g., a regional trail).

Additional guidance and figures, including appropriate signage and striping for constructions zones and detour routes, is included in Appendix F.

The closure plan shall also follow these recommendations for public outreach strategies:

- Brochures and Mailers – The brochures and mailers shall contain project-related information, including project description, construction schedule, and detour maps. They shall be printed out and disseminated to Bay Trail users before construction begins.

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[9] Alta Planning + Design in association with Fehr & Peers and Eisen | Letunic, 2011. "A Resource Fuide for the Education, Promotion, Funding, and Design of Pedestrian and Bicycle Facilities: A Companion Document to the San Mateo County Comprehensive Bicycle and Pedestrian Plan."

[10] Santa Clara Valley Transportation Authority, 2012. "Bicycle Technical Guidelines."

- Social Media – Use appropriate social media sites (Twitter, Facebook, etc.) to target user groups and alert them of the trail closure and detour routes. Work with cycling and pedestrian advocacy groups to craft the most effective messaging.
- Press Release – Issue press releases for radio, television, and print media for the planned closures and proposed detours. (LTS)

(4) Transit Facilities

The project would generate construction truck trips in the vicinity of existing transit services. However, the project would not contribute substantial additional transit trips and does not include features that would disrupt existing or planned transit routes or facilities. Therefore, impacts to transit facilities are anticipated to be less than significant.

(5) Emergency Access

As presented previously, construction truck traffic would represent less than 1.6 percent of daily traffic volumes on any one roadway segment in Foster City, while the vast majority of segments would experience less than a 0.5-percent increase due to construction trucks. The project does not include features that would alter emergency vehicle access routes or roadway facilities; Fire, water and police vehicles would continue to have access to all facilities around the entire City. Therefore, impacts to emergency vehicle access are anticipated to be less than significant.

(6) Air Traffic

The project is not anticipated to contribute substantially to demand for commercial flights. Therefore, the project would not substantially increase flight operations. In addition, no buildings or features would be constructed that would interfere with flight operations at local airports. Therefore, impacts to air traffic are anticipated to be less than significant.

L. RECREATION

This section analyzes the proposed project's impacts to recreation based on an analysis of the Foster City General Plan Parks and Open Space Element. Potential impacts are identified and mitigation measures to reduce those impacts to a less-than-significant level are provided.

1. Environmental Setting

Foster City contains 24 parks and recreational facilities, including the levee pedway, within the 4 square miles that comprise the city. The parks range in size from 0.12 to 23.9 acres and total approximately 113.8 acres. In addition, the city contains 212 acres of recreational waterways, for a total of 325.8 acres.[1] Almost all residents live within ¼ mile of a park or private recreational facility. Those who do not live within ¼ mile of a park live within ¼ mile of the waterfront.[2] Recreational and community facilities include the Foster City Community Center (1000 E. Hillsdale Boulevard); the VIBE Teen Center (670 Shell Boulevard); and the William E. Walker Recreation Center, which includes the Senior Center (650 Shell Boulevard).

The project site encompasses the entirety of the pedway, which covers 43.3 acres and is 7 miles long.[3] The pedway, which consists of a concrete pathway atop the levee, provides public access to San Francisco Bay, Belmont Slough, and the Marina Lagoon. The pathway has viewpoints with benches and can be used for walking, running, or cycling around the waterfront. It is part of the San Francisco Bay Trail (Bay Trail), a much larger regional trail encircling San Francisco Bay. The pedway is considered a Class 1 pathway because it is completely separated from motor vehicles.[4]

Five parks are adjacent to the project site: Bridgeview Park, Shorebird Park, Sea Cloud Park, Gateshead Park, and Port Royal Park. Bridgeview Park is a 1.42-acre park southeast of San Mateo Bridge/SR 92 with a planter area and benches. Shorebird Park is a 3.85-acre park on the east side of Beach Park Boulevard near its intersection with Halibut Street. Sea Cloud Park is a 23.9-acre park north of Belmont Slough that features baseball diamonds, soccer fields, a lawn area, play apparatus, snack shack, and batting cages. Gateshead Park is a 0.12-acre park with shade trees, drinking fountains, and picnic tables. Port Royal Park is a 3.98-acre park with basketball courts, a bike path, a children's play area, a picnic area, restrooms, and soccer fields.

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[1] City of Foster City, 2016d. Park Grid. http://www.fostercity.org/parksandrecreation/park-grid.cfm, accessed May 5.

[2] City of Foster City, 2016a. Foster City Online Map. http://www.fostercity.org/gis/, accessed May 5.

[3] City of Foster City, 2009. *General Plan, Chapter 5, Parks and Open Space Element*. Adopted September 9.

[4] Ibid.

The City of Foster City (City) currently uses the standard of 5 acres of parkland per 1,000 residents as a threshold to measure how well its citizens are provided with park and recreational facilities access. With a 2016 population of 33,201,[5] it is estimated that Foster City currently provides nearly 10 acres of parkland (including recreational waterways) per 1,000 residents, far exceeding the above standard.

a. Regulatory Context

The regulatory context for recreation in Foster City, including statewide mandates and local General Plan policies, is described below.

(1) General Plan Policies

The Foster City General Plan includes multiple policies from a number of plan elements that are related to recreation.

Parks and Open Space Element

Goal PC-A: Provide Sufficient and Diverse Recreational Opportunities. Provide sufficient and diverse recreational opportunities for all the City of Foster City residents through the development of new recreational facilities as needed, given available funding and support, and the construction of additional park amenities in existing parks and elsewhere in locations where deficiencies have been identified or opportunities occur.

Goal PC-B: Maintain Existing Recreation Facilities. Maintain current park amenities and infrastructure in a safe, attractive and functional recreation environment.

Goal PC-C: Maintain and Improve the City's Pedway and Bikeway System. Maintain and Improve the City's Pedway and Bikeway System. Maintain and improve the pedway system that surrounds the City of Foster City and the walkway system that provides safe access to parks, schools and other streets.

Policy PC-4: Park Improvements. Improve existing parks by adding new facilities to those with identified deficiencies. Work with San Mateo County to provide public use of the Werder Pier restroom facility in conjunction with evaluating other locations for a public restroom facility for use by pedestrians using the levee pedway.

Policy PC-7: Bike Path System. Develop a City of Foster City bike path system to connect major work, shopping, school, civic and recreational destinations throughout the city.

Policy PC-8: Recreational Use of Pedestrian Walkways. Improve the recreational use of existing pedestrian walkways where appropriate.

Policy PC-9: Pedway and Bikeway System Maintenance and Improvement. Continue to maintain, expand and improve the existing walkway and pedway system.

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[5] California Department of Finance, 2016. E-1 Population Estimates for Cities, Counties, and the State. http://www.dof.ca.gov/research/demographic/reports/estimates/e-1/view.php, accessed June 5.

Policy PC-10: *Improvements in Open Space*. Design any improvements in open space areas to minimize adverse impacts to habitats, including provision of a buffer to minimize human disturbances, views or other open space resources.

Policy PC-12: Bayfront Open Space System. Provide a continuous open space system along San Francisco Bay and the Belmont Slough.

Policy PC-15: Access to Existing Open Space. Design open space already in public ownership to be more accessible to the public.

Policy PC-16: Open Space Access for Special Need Groups. Design open space to be accessible to people with special needs such as elderly and handicapped persons.

Policy PC-23: Cooperation with Other Agencies. Work with other agencies to promote and provide regional recreation opportunities.

Program PC-c: Implement the City of Foster City Bikeway System Report. Implement the City of Foster City Bikeway System Report, adopted by the City Council on January 7, 1991.

Program PC-g: Levee Pedway Maintenance. Maintain the levee pedway, repairing and resurfacing when necessary.

Program PC-h: Existing Pedway Enhancement. Enhance the existing pedway system by providing observation points, water fountains, additional and replacement landscaping, trash cans, additional paved access points with hand rails and additional benches along the pathways.

Program PC-j: Special Needs. Require that any improvements to open space lands be designed to accommodate people with special needs.

Program PC-s: Shoreline Band. Work with the Bay Conservation Development Commission and the Association of Bay Area Governments to protect and enhance the 100-foot shoreline band for conservation and recreation.

Program PC-v: Bay Trail. The City of Foster City shall work with the Bay Conservation Development Commission and all other applicable agencies to develop a Bay Trail System.

Conservation Element

Policy C-x: Public Viewing Areas. Expand public opportunities to learn about wetland areas and endangered species by creating public viewing areas with exhibits.

2. Impacts and Mitigation Measures

This subsection analyzes environmental impacts related to land use that could result from implementation of the proposed project. Included are: (1) the criteria of significance, which establish the thresholds for determining whether an impact is significant; and (2) the recreation impacts that could result from construction and/or operation of the project and any necessary mitigation measures to reduce significant impacts. Impacts are divided into separate categories based on their significance according to the following criteria: less-than-significant impacts (which do not require mitigation) and significant impacts (which do require mitigation).

a. Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed project would have a significant impact on air quality if it would:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Create a shortage of parks facilities for new residents, because total parks acreage does not meet the government standard of 5 acres per 1,000 persons (Foster City Municipal Code Section 16.36).
- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.
- Substantially restrict or reduce the availability, access, or quality of existing recreational opportunities in the project study area.

In addition, construction-related impacts would be significant if construction activities would:

- Substantially restrict or reduce the availability, access, or quality of existing recreational opportunities in the project study area.

b. Less-Than-Significant Recreation Impacts

Less-than-significant recreation impacts of the proposed project are discussed below.

(1) Substantial Physical Deterioration of Parks or Facilities

The proposed project would not construct any housing or infrastructure improvements that could generate new residents to increase the use of existing parks or recreational facilities. Therefore, the proposed project would not increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated or result in the construction or expansion of existing recreational facilities.

(2) Shortage of Parks Facilities for New Residents

With a 2016 population of 33,201, Foster City currently provides nearly 10 acres of recreational waterways and parks per 1,000 residents; double General Plan Park and Open Space Element recommended standard of 5 acres per 1,000 persons. As stated above, the proposed project would not result in the generation of new residents, nor would it remove any of the existing park facilities. Therefore, the proposed project would not have any potential to create a shortage of parks for new residents.

(3) Recreational Facilities Which Might Have an Adverse Impact on the Environment

The Bay Trail, which runs on top of the levee and is part of Foster City's recreational system, would be replaced in-kind or better after the project is completed. Improvements would include observation points, trash cans, benches/seating, and improved access points meeting ADA requirements. The new trail would be 14–16 feet wide (10 feet paved with a 2-foot shoulder on each side and an additional 1 foot of shoulder adjacent to vertical walls where feasible). The existing paved Bay Trail is approximately 8 feet wide. While the Bay Trail could be widened and improved in places, this widening would not constitute a substantial expansion in the footprint of the trail. Furthermore, the expansion of the trail would not be an end in itself, but rather an end result of the expansion of the levee footprint. The impacts of the expansion of the levee footprint are analyzed in other sections of this Environmental Impact Report. Therefore, the proposed project would not expand the Bay Trail in such a manner as to result in an impact on the environment, and this impact would be less than significant.

(4) Existing Recreational Opportunities – Operation

The operation period of the proposed project ranges from 30 years for the 2050 Sea Level Rise scenario to 80 years for the 2100 Sea Level Rise scenario. Because the Bay Trail would be replaced in-kind or better, the project would not reduce or restrict the availability, access, or quality of existing recreational opportunities. As discussed in *Section V.A., Aesthetics and Shade and Shadow*, the recreational experience on the Bay Trail would be permanently altered because the levee would be raised either 0.5–7 feet under the 2050 Sea Level Rise scenario or 4–10.5 feet under the 2100 Sea Level Rise scenario (as shown in Table III-2). Currently, trail users are immediately adjacent to San Francisco Bay or associated wetlands along most of the Bay Trail. With the proposed project, the Bay Trail would be substantially elevated compared with existing conditions under both the 2050 Sea Level Rise and 2100 Sea Level Rise scenarios along levee segments 2, 3, and 4. As a result, trail users would view the bay and other aesthetically pleasing features from an elevated viewpoint. Some users may prefer the elevated viewpoint while others may wish to cycle, walk, or jog at the same elevation as their surroundings; this determination is subjective in nature and would vary from user to user. Therefore, this impact would be less than significant.

c. Significant Recreation Impacts and Mitigation Measures

Implementation of the proposed project would result in one significant recreation impact described below.

(1) Existing Recreational Opportunities – Construction

As described in *Chapter V.K, Traffic and Transportation*, certain segments of the Bay Trail would be temporarily closed due to construction of the proposed improvements. As described in *Chapter III, Project Description*, only select portions of the Bay Trail would be closed simultaneously, as directed by the City, to ensure no two contiguous (adjacent) segments of the Bay Trail would be closed at one time. Nevertheless, the closures would result in a significant recreation impact temporarily.

Impact REC-1: Construction of the Levee project would temporarily reduce the availability and access of the Bay Trail. (S)

Implementation of the following mitigation measure would reduce this impact to a less-than-significant level:

Mitigation Measure REC-1: Implement Mitigation Measure TRANS-1. (LTS)

Under this mitigation measure, Bay Trail detour routes would be provided for trail users under both the 2050 Sea Level Rise and the 2100 Sea Level Rise scenarios in a Bay Trail closure plan. Additionally, the closure plan would include a plan for Memorial Benches currently located along the Bay Trail that would include either re-locating or placing them in the same location (depending on final design details and final wall elevations).

Levee improvements would be adjacent to or in close proximity to Foster City parks and recreational facilities: Mariners Point Golf Center in segment 1; Bridgeview Park in segment 3; Shorebird Park in segment 4; Sea Cloud Park in segments 5 and 6; Gateshead Park in segment 7; and Port Royal Park in segment 8. No city parks along the project site are expected to be closed during construction or operation of the project.

As described above, construction of levee improvements would occur at various intervals throughout the construction season under both the 2050 Sea Level Rise and the 2100 Sea Level Rise scenarios, thereby minimizing the potential for park closures to occur at the same time.

d. Cumulative Recreation Impacts

For recreation, the geographic scope for assessing cumulative impacts is all of Foster City since parks and recreational facilities could be used by residents from anywhere within Foster City. A cumulative recreation impact related to the proposed project could occur only during construction of the levee; as discussed above; operational recreation impacts of the levee would be negligible.

A cumulative recreation impact could result if other parks or recreational facilities would be permanently or temporarily closed during the proposed project's construction timeline anticipated to begin in 2018 and last 1.5–2 years under the 2050 Sea Level Rise scenario or 2–2.5 years under the 2100 Sea Level Rise scenario, thereby further reducing the access and availability of recreational opportunities for residents. Currently, there are no reasonably foreseeable permanent or temporary park closures that would occur during this time period. Therefore, cumulative recreation impacts are less than significant. Even if this were not the case, as discussed above, the project's contribution to a recreation impact would not be cumulatively considerable.

VI. ALTERNATIVES

The California Environmental Quality Act (CEQA) Guidelines require the analysis of a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the project's basic objectives and avoid or substantially lessen any of the significant effects of the project. The range of alternatives required in an Environmental Impact Report (EIR) is governed by a "rule of reason" that requires the EIR to set forth only those alternatives necessary to permit a reasoned choice.[1] An EIR need not consider every conceivable alternative to a project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

For purposes of CEQA, this EIR considers four alternatives to the proposed project in detail:

- **No Project/No Build Alternative** — assumes the project would not be developed. The existing levee would remain in its current condition.
- The **Existing Levee Footprint 2050 Sea Level Rise Alternative** — assumes the project would improve the approximately 43,000-linear-foot (8 miles) existing levee system with no deviation from the existing levee system alignment. This alternative assumes the same levee improvement types as described under the proposed project's 2050 Sea Level Rise project scenario. Unlike the both project scenarios, there would be no deviation within segment 4 from the existing levee system alignment.
- **Horizontal Levee 2050 Sea Level Rise Alternative** — assumes portions of the levee system (segment 2) would be replaced with earthen fill in what is known as an "ecotone slope" or "horizontal levee" that blend a traditional earthen levee with restored tidal marshes. This alternative assumes the same levee improvement types for segment 1 and segments 3 through 8 as described under the proposed project's 2050 Sea Level Rise project scenario.
- **FEMA Freeboard Alternative** — assumes the project site would be located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system with the same slight deviation within segment 4 as both proposed project scenarios. This alternative would have the same levee improvement types and locations as the proposed project's 2050 Sea Level Rise project scenario but the top elevation for the levee/floodwall would be lower as it would only meet the elevations necessary to retain FEMA accreditation. The current levee ranges from

[1] CEQA Guidelines, 1998, Section 15126.6.

11–13 feet NAVD 88 and it would range from 12.5–16.5 feet NAVD 88 under this alternative (under the 2050 Sea Level Rise project scenario it would range from 13.5–19 feet NAVD 88). This alternative would only require 7,000–8,000 cubic yards of fill to raise the elevation of the levee. This alternative will satisfy FEMA's requirement for accredited levees but not achieve protection from anticipated sea level rise.

The level of analysis of these four alternatives is less than that presented in *Chapter V, Impacts and Mitigation Measures*, which analyzes the proposed project. CEQA requires an EIR to include sufficient information about each alternative to allow evaluation, analysis, and comparison with the proposed project, but in less detail than the analysis of the project. In addition, five other alternatives were considered and rejected from further analysis because they were either infeasible or did not satisfy most of the project objectives (or both). These are presented below in subsection D, Alternatives Considered but Rejected for Detailed Analysis.

A. IDENTIFYING THE RANGE OF ALTERNATIVES

To help inform the selection of a reasonable range of alternatives for the Levee project that would feasibly attain most of the project's objectives and avoid or substantially lessen any of the significant effects of the project, a review of the Levee project objectives and impacts and mitigation measures is provided below.

1. Project Objectives and Impacts

The proposed project, which includes two alternative scenarios (the 2050 Sea Level Rise project scenario and the 2100 Sea Level Rise project scenario), is described in detail in *Chapter III, Project Description*, and the potential environmental effects of the proposed project are analyzed in *Chapter V, Setting, Impacts, and Mitigation Measures*. The project objectives and impacts are summarized below.

a. Project Objectives

The Levee project objectives, which are first presented in *Chapter III, Project Description,* include:

1. Meet current FEMA standards.
2. Expedite permitting and construction of necessary levee improvements to the extent feasible to retain FEMA levee accreditation before such accreditation is lost.
3. Provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future as needed.
4. Maintain public access and recreational opportunities.

5. Minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and State (including wetlands) on the bayside of the existing levee.
6. Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the existing levee.
7. Avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal and State-listed species to the maximum extent feasible.

b. Project Impacts

The potential environmental effects of implementing the proposed project, which includes two alternate scenarios (the 2050 Sea Level Rise project scenario and the 2100 Sea Level Rise project scenario), are analyzed in *Chapter V, Settings, Impacts, and Mitigation Measures.* To help define project alternatives that could further reduce or eliminate significant impacts, the impacts of the proposed project—comprised of the two alternate scenarios—are summarized below.

Potentially significant and unavoidable impacts are identified for the following resource topics:

- Aesthetics and Shade and Shadow — The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios and adversely impact scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.
- Noise and Vibration — Construction of the proposed project could result in the exposure of nearby sensitive receptors, such as residences, schools, hospitals, and retirement homes, to temporary noise levels that would conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving).

Potentially significant impacts that could be mitigated to a less-than-significant level with implementation of recommended mitigation measures (as described in Table II-1 Summary of Impacts and Mitigation Measures in *Chapter II, Summary*) include:

- Aesthetics and Shade and Shadow — (Impact AES-1: The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.)
- Air Quality — (Impact AIR-1: Fugitive dust emissions generated during project construction may result in significant air quality impacts; AIR-2: Exhaust emissions generated during project construction may result in significant air quality impacts; and AIR-3: Cumulatively considerable net increase of any criteria pollutant for

which the project region is in nonattainment under an applicable federal or state ambient air quality standard.)

- Biological Resources — (BIO-1: The Levee project could result in significant impacts to special-status animal species; BIO-2: Project construction could introduce invasive, non-native plants into the project area; BIO-3: The Levee project would permanently impact federally protected wetlands; and BIO-4: Project construction involving vegetation removal during the bird nesting season could result in bird mortality or nest failure, and project construction could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream.)
- Cultural Resources — (CULT-1: The Levee project could cause a substantial adverse change in the significance of an archaeological resource; CULT-2: The Levee project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; CULT-3: The Levee project could directly or indirectly disturb human remains, including those interred outside of formal cemeteries; and CULT-4: The Levee project could cause an adverse change in the significance of a tribal cultural resource as defined in Public Resources Code Section 21074.)
- Soils, Geology, and Seismicity — (GEO-1: Damage to Levee project structures or property could result from unstable soil conditions during the construction period; GEO-2: Damage to Levee project structures or property could result from unstable or corrosive soils during the operation period; GEO-3: Levee project structures would be subject to seismic shaking hazards during the operation period.)
- Hazards and Hazardous Materials — (HAZ-1: Levee project construction period activities could result in accidental releases of hazardous materials and/or the disturbance and reuse of soil potentially impacted with hazardous materials that could result in impacts to construction workers, the public, and/or the environment; and HAZ-2: Construction of the improved levee could interfere with the use of the emergency response/evacuation routes.)
- Hydrology and Water Quality — (HYD-1: Construction of the proposed project could result in degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay.)
- Noise and Vibration — (NOISE-1: Noise from hauling trucks on area roadways associated with the Levee project construction could generate noise levels that disturb nearby receptors; NOISE-2: Noise from hauling trucks along the levee associated with Levee project construction could generate noise levels that disturb nearby receptors; NOISE-3: Operation of the construction equipment on the Levee project site and in the staging areas could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City's Municipal

Code; and NOISE-4: Construction of the Levee project could result in the exposure of nearby receptors to excessive vibration.)

- Traffic and Transportation — (TRANS-1: The Levee project would temporarily disrupt pedestrian and bicycle facilities.)
- Recreation — (REC-1: Construction of the Levee project would temporarily reduce the availability and access of the Bay Trail.)

Impacts are anticipated to be less than significant for all other environmental topics.

Each of the two project scenarios would significantly contribute to a significant cumulative impact (relating to fugitive dust from project construction); however, this impact could be mitigated to a less-than-significant level with mitigation for each project scenario.

B. ALTERNATIVES ANALYZED IN DETAIL

In accordance with CEQA, the following discussion of alternatives is included to provide the public and decision-makers with information that will help them understand the adverse impacts and benefits associated with potential alternatives to the proposed project. A discussion of the environmentally superior alternative is also provided, as required by CEQA.

Four alternatives to the project are analyzed these include:
- No Project/No Build Alternative
- Existing Levee Footprint 2050 Sea Level Rise Alternative
- Horizontal Levee 2050 Sea Level Rise Alternative
- FEMA Freeboard Alternative

These four alternatives constitute a reasonable range of alternatives. A comparison of the impacts associated with each alternative is provided in Table VI-1.

1. No Project/No Build Alternative

a. Principle Characteristics

The No Project/No Build Alternative assumes that the levee would remain in its existing condition and no new improvements would be constructed on the project site. No increased flood protection would be provided.

b. Relationship with Project Objectives

The No Project/No Build Alternative would not achieve the following three of the seven objectives of the proposed project, including:

- Meet current FEMA standards (objective 1).

TABLE VI-1 SUMMARY COMPARISON OF ALTERNATIVES IMPACTS

Impact Category	Proposed Project Scenarios	No Project/ No Build Alternative	Existing Levee Footprint 2050 Sea Level Rise Alternative	Horizontal Levee 2050 Sea Level Rise Alternative	FEMA Freeboard Impacts
Aesthetics and Shade and Shadow	SU	<	<	<	<
Air Quality	LTS after Mitigation	<	=	>	<
Biological Resources	LTS after Mitigation	<	=	<	=
Cultural Resources	LTS after Mitigation	<	=	>	=
Soils, Geology, and Seismicity	LTS after Mitigation	<	=	>	=
Greenhouse Gas Emissions	LTS	<	=	>	=
Hazards and Hazardous Materials	LTS after Mitigation	<	=	>	=
Hydrology and Water Quality	LTS after Mitigation	>	=	>	=
Land Use	LTS	<	=	=	=
Noise and Vibration	SU	<	=	>	=
Recreation	LTS after Mitigation	<	=	>	=
Traffic and Transportation	LTS after Mitigation	<	=	>	=

Note: Symbols >/</= denote whether the alternative has more, less, or equal impacts to the proposed project scenarios. Project impacts are abbreviated as LTS (Less Than Significant) and SU (Significant and Unavoidable).
Source: Urban Planning Partners, 2016.

- Expedite permitting and construction of necessary levee improvements to the extent feasible to retain FEMA levee accreditation before such accreditation is lost (objective 2).
- Provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future, as needed (objective 3).

Objectives 4 through 7, which relate to minimizing impacts on biological resources and maintaining public access, would technically be achieved given no improvements would occur, or would not be applicable.

c. Analysis of the No Project/No Build Alternative

The potential impacts of the No Project/No Build Alternative are described below.

(1) Aesthetics and Shade and Shadow

Under the No Project/No Build Alternative, the project site would remain undeveloped, and its visual quality and impact on scenic resources unchanged. As described in *Section V.A, Aesthetics and Shade and Shadow*, of this Draft EIR, potential impacts of the two proposed project scenarios related to the visual character and scenic resources would be significant and unavoidable because the increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (under both project scenarios), and may impact scenic vistas of the Belmont Hills from Sea Cloud Park (under the 2100 Sea Level Rise project scenario). As no development would result under the No Project/No Build Alternative, there would be no impacts related to adverse changes to the visual quality and scenic vistas for park users and recreationists utilizing Shorebird Park (segment 4) and Sea Cloud Park (segment 6), which would result from implementation of the proposed project scenarios (see Impact AES-1). This alternative would therefore avoid the significant and unavoidable impacts related to aesthetics and shade and shadow that would result from both project scenarios. As such, the No Project/No Build Alternative would result in a less severe aesthetic impact compared to the proposed project.

(2) Air Quality

This No Project/No Build Alternative would not change the existing air quality. As described in *Section V.B, Air Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to fugitive dust and exhaust emissions would be significant due to project construction activities including the use of off-road equipment and on-road vehicles. Under this alternative, there would be no construction activity or increases in vehicle trips associated with improvements to the levee. The No Project/No Build Alternative would avoid the temporary mitigatable construction-related emissions and dust impacts that would result from both proposed project scenarios. No operational air quality impacts would result from implementation of this alternative, as is also the case for both proposed project scenarios (see Impacts AIR-1, 2, and 3). As such, the No Project/No Build Alternative would result in less severe air quality impacts compared to the proposed project.

(3) Biological Resources

The No Project/No Build Alternative would not result in an 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 (CDFW) or U.S. Fish and Wildlife Service's (USFWS). As described in *Section V.C, Biological Resources*, of this Draft EIR, the two proposed project scenarios may significantly impact special-status animal species, federally protected wetlands, fish and wildlife movement, wildlife corridors, or wildlife nursery sites would be significant during project construction. Construction activities would modify nesting or foraging habitat for Ridgway's rail, salt marsh harvest mouse, and California black rail and introduce invasive, non-native plants. Additionally, project construction would permanently impact portions of federally protected wetlands and involve vegetation removal during the bird nesting season that could result in bird mortality or nest failure, and promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. Lastly, the use of sheet pile walls at the top of the levee would restrict movements of wildlife. This alternative would leave the site to its existing conditions, and therefore, would not have a substantial adverse effect on any riparian habitat, federally protected wetland, or other sensitive natural community. It would therefore avoid the significant but mitigatable biological resources impacts resulting from both proposed project scenarios (see Impacts BIO-1, 2, 3, and 4). As such, the No Project/No Build Alternative would result in less severe biological impacts compared to the proposed project.

(4) Cultural Resources

The No Project/No Build Alternative would not cause a substantial adverse change in the significance of historical or archaeological resources. As described in *Section V.D, Cultural Resources*, of this Draft EIR, excavation and grading activities associated with construction of either of the two proposed project scenarios may significantly impact archaeological or resources as defined in Public Resources Code Section 21074, a unique paleontological resource or site, a unique geologic feature, or human remains.. As no excavation or construction would occur under this alternative, there would be no effect to unique paleontological resources or geological features, nor a disturbance to human remains, including those interred outside of formal cemeteries. This alternative would not cause an adverse change in significance of tribal cultural resources, as the site would be unchanged. Therefore it would avoid the significant impacts identified for both project scenarios (see Impacts CULT-1, 2, 3, and 4). As such, the No Project/No Build Alternative would result in less severe cultural impacts compared to the proposed project.

(5) Soils, Geology, and Seismicity

The No Project/No Build Alternative would not result in any levee improvements, and thus would not expose new structures to major seismic hazards. As described in *Section V.E, Soils, Geology, and Seismicity*, of this Draft EIR, the creation of temporary slopes, excavation, and stockpiling during construction of either of the two proposed project scenarios may significantly impact settlement and differential settlement. Additionally, potential operational impacts related to expansive and corrosive soils and ground shaking would be significant because the site fill is corrosive and all structures in the San Francisco Bay Area could be affected by ground shaking in the event of an earthquake on regional active faults. This alternative would avoid the significant impacts related to settlement and differential settlement, but the project site would still be susceptible to seismic groundshaking and adverse soils conditions, as identified in the analysis of the proposed project scenarios (see Impacts GEO-1, 2, and 3). As such, the No Project/No Build Alternative would result in less severe soils, geology, and seismicity impacts compared to the proposed project.

(6) Greenhouse Gas Emissions

The No Project/No Build Alternative would result in no operational or construction activity at the project site. As a result, it would produce no new greenhouse gas (GHG) emissions. As described in *Section V.F, Greenhouse Gas Emissions*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to greenhouse gas emissions. As would be the case under the proposed project, this alternative would not conflict with any plans or policies related to the reduction of GHGs. Unlike the proposed project, this alternative would not generate any new GHG emissions. While construction and operation of the proposed project would result in numerous activities that contribute to GHG emissions, it was determined these emissions would not exceed Bay Area Air Quality Management District (BAAQMD) thresholds and found to be less than significant. The No Project/No Build Alternative would result in no impacts related to GHGs. As such, the No Project/No Build Alternative would result in less severe greenhouse gas emissions impacts compared to the proposed project.

(7) Hazards and Hazardous Materials

Implementation of the No Project/No Build Alternative would not involve the use, transport, or disturbance (via soil excavation) of any hazardous materials. As described in *Section V.G, Hazards and Hazardous Materials*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to the accidental release of hazardous materials into the environment and interference with an adopted emergency response plan or emergency evacuation plan would be significant because hazardous material such as oils, grease, and fuels for construction vehicles and equipment would be transported and used on-site for proposed construction activities. Similarly, the disturbance and reuse of soil potentially impacted with hazardous materials during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. Additionally, the proposed levee improvements in areas of trails/fire access roads could interfere with the use of these trails/fire access roads for emergency response and evacuation purposes during construction. With this alternative, there would be no significant hazards to the public or the environment through the routine transport, use, or disposal of hazardous materials, or significant hazard to the public or the environment through reasonable foreseeable upset or accident conditions involving the release of hazardous materials into the environment. Similarly, this alternative would not expose construction workers or the public to hazardous materials from contaminants in the soil during and following construction activities as no construction activity would occur. It would avoid significant hazards and hazardous materials impacts (see Impacts HAZ-1 and 2). As such, the No Project/No Build Alternative would result in less severe hazards and hazardous materials impacts compared to the proposed project.

(8) Hydrology and Water Quality

The No Project/No Build Alternative would not result in the construction of any new structures, and the project site would remain in its current state. As described in *Section V.H, Hydrology and Water Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to degradation of water quality would be significant due to construction activities that would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. This alternative would produce no new near-term significant impacts related to water quality standards, water quality degradation, runoff, flooding, water-oriented natural hazards, groundwater or drainage and would avoid significant Impact HYD-1. However, overtime the flooding hazard would increase and the existing levee could be regularly overtopped, potentially exposing all the City of Foster City to flood hazards. In addition, flood waters would come into contact with urban development and would entrain pollutants, reducing surface water quality. With regard to flooding and water quality degradation, the No Project/No Build Alternative would have increased impacts relative to the proposed project scenarios. The impacts related to flooding and water quality degradation would be significant and unavoidable. As such, the No Project/No Build Alternative would result in a more severe hydrology and water quality impact compared to the proposed project.

(9) Land Use

Implementation of the No Project/No Build Alternative would result in the continuation of existing land uses on the project site. As described in *Section V.I, Land Use*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to land use. As would be the case under the proposed project scenarios, this alternative would not physically divide the existing community, nor conflict with habitat conservation plans. Thus, this alternative would not result in any significant land use impacts, similar to the proposed project scenarios.

(10) Noise and Vibration

No construction activity would occur under the No Project/No Build Alternative. As described in *Section V.J, Noise and Vibration* of this Draft EIR, the two proposed project scenarios would significantly impact nearby receptors during project construction. Construction activities would generate noise levels and vibration that would exceed standards established in the Foster City Municipal Code or the Federal Transit Administration's recommended vibration thresholds. This alternative would not result in increased traffic and would not expose existing residences or offices to increased noise levels. Therefore, the No Project/No Build Alternative would result in no significant impacts related to noise exposure, increased noise levels and construction-related noise. It would avoid the significant impacts identified for the project related to noise and vibration (see Impacts NOISE-1, 2, 3, and 4). As such, the No Project/No Build Alternative would result in less severe noise and vibration impacts compared to the proposed project.

(11) Traffic and Transportation

No construction activity would occur under the No Project/No Build Alternative. As described in *Section V.K, Traffic and Transportation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The No Project/No Build Alternative would not involve closing sections of the Bay Trail. Therefore, this alternative would avoid impacts related to a temporary disruption to pedestrian and bicycle facilities during the construction period, as identified in the project analysis (see Impact TRANS-1). As such, the No Project/No Build Alternative would result in a less severe traffic and transportation impact compared to the proposed project.

(12) Recreation

The No Project/No Build Alternative would result in no new improvements at the project site and therefore, no construction activity. As described in *Section V.L, Recreation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. As a result, this alternative would not temporarily reduce the availability and access of the Bay Trail during construction and it would avoid Impact REC-1, identified in the project analysis. As such, the No Project/No Build Alternative would result in a less severe recreation impact compared to the proposed project.

2. Existing Levee Footprint 2050 Sea Level Rise Alternative

a. Principle Characteristics

The Existing Levee Footprint 2050 Sea Level Rise Alternative assumes the project would improve the approximately 43,000-linear-foot (8 miles) existing levee system with no deviation from the existing levee system alignment. Unlike the proposed project scenarios, this alternative would not deviate within segment 4 from the existing levee system alignment. Similar to the 2050 Sea Level Rise project scenario, this alternative assumes the levee improvement types would consist of sheet pile floodwall, earthen levee, and conventional floodwall, that range from 13.5–18 feet in elevation and would include 34,000–46,000 square feet of fill (as analyzed in the 2050 Sea Level Rise project scenario).

b. Relationship with Project Objectives

The Existing Levee Footprint 2050 Sea Level Rise Alternative would achieve all of the project objectives with the exception of objective 2: Expedite the permitting and construction of necessary levee improvements to the extent feasible to retain FEMA levee accreditation before it is lost. As explained in *Chapter III, Project Description*, both proposed project scenarios slightly deviate from the existing levee system alignment within segment 4. The purpose of this deviation is to avoid certain property of an owner that has questioned the City's rights to improve a minor portion of the existing levee system crossing the owner's property, and has threatened litigation against the City if the City makes further improvements to this levee system portion. The City is confident that it has the legal right to improve this levee system portion and would therefore succeed in defending against such litigation. However, the construction delay associated with such litigation would delay the schedule required to retain FEMA accreditation. If FEMA accreditation is not retained, approximately 17,000 individual properties within Foster City and San Mateo could be placed within a FEMA-designated Special Flood Hazard Area due to the risks associated with levee overtopping. As such, this alternative could prevent achievement of the project objective to retain FEMA levee accreditation before it is lost (objective 2).

The remaining project objectives that would be achieved by this alternative include:

- Meet current FEMA standards (objective 1).
- Provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future, as needed (objective 3).
- Maintain public access and recreational opportunities (objective 4).
- Minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and State (including wetlands) on the bayside of the existing levee (objective 5).

- Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the existing levee (objective 6).
- Avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal and State-listed species to the maximum extent feasible (objective 7).

c. Analysis of the Existing Levee Footprint 2050 Sea Level Rise Alternative

The potential impacts of the Existing Levee Footprint 2050 Sea Level Rise Alternative are described below.

(1) Aesthetics and Shade and Shadow

As described in *Section V.A, Aesthetics and Shade and Shadow*, of this Draft EIR, potential impacts of the two proposed project scenarios related to the visual character and scenic resources would be significant and unavoidable because the increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (under both project scenarios), and may impact scenic vistas of the Belmont Hills from Sea Cloud Park (under the 2100 Sea Level Rise project scenario). Like 2050 Sea Level Rise project scenario, the levee elevation for the Existing Levee Footprint 2050 Sea Level Rise Alternative would be 13.5–18 feet at Shorebird Park and the impacts would be the same. Relative to the 2100 Sea Level Rise project scenario (elevation of 16–21.5 feet), the impact under this alternative would be incrementally less as the elevation would be 2.5–3.5 feet lower. Therefore, the Existing Levee Footprint 2050 Sea Level Rise Alternative would change visual quality for recreationists and obstruct scenic vistas of the San Francisco Bay at this location (as described in Impact AES-1).

In Sea Cloud Park, the increase in elevation for this alternative would be the same as that of 2050 Sea Level Rise project scenario with an elevation of 13.5 feet; therefore, the impact on visual quality and scenic vistas would be identical to 2050 Sea Level Rise project scenario. This impact would be incrementally less than the 2100 Sea Level Rise project scenario that has an elevation of 16 feet and blocks views of the Belmont Hills. Although this impact would be less than significant in Sea Cloud Park (segment 6), this impact would remain significant and unavoidable in Shorebird Park (segment 4). As such, the Existing Levee Footprint 2050 Sea Level Rise Alternative would result in a less severe aesthetic impact compared to the proposed project.

(2) Air Quality

As described in *Section V.B, Air Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to fugitive dust and exhaust emissions would be significant due to project construction activities including the use of off-road equipment and on-road vehicles. The Existing Levee Footprint 2050 Sea Level Rise Alternative would temporarily pose impacts on air quality due to construction. Under this alternative, construction activity and increases in vehicle trips associated with transporting additional fill would occur. Similar to the proposed project scenarios, this alternative would result in significant impacts related to fugitive dust and exhaust emissions standards during project construction because the same amount of fill is proposed under the 2050 Sea Level Rise project scenario (see Impacts AIR-1, 2, and 3). As with the proposed project scenarios, implementation of the identified mitigation measures would reduce the alternative's impact to a less-than-significant level. Therefore, the impact to air quality would be equal to the proposed project scenarios and would be mitigated to a less-than-significant level with the identified mitigation measures.

(3) Biological Resources

As described in *Section V.C, Biological Resources*, of this Draft EIR, the two proposed project scenarios may significantly impact special-status animal species, federally protected wetlands, fish and wildlife movement, wildlife corridors, or wildlife nursery sites would be significant during project construction. Construction activities would modify nesting or foraging habitat for Ridgway's rail, salt marsh harvest mouse, and California black rail and introduce invasive, non-native plants. Additionally, project construction would permanently impact portions of federally protected wetlands and involve vegetation removal during the bird nesting season that could result in bird mortality or nest failure, and promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. Lastly, the use of sheet pile walls at the top of the levee would restrict movements of wildlife. The Existing Levee Footprint 2050 Sea Level Rise Alternative would require construction activities that would result in significant impacts to special-status animal species including the Ridgway's rail, salt marsh harvest mouse, and California black rail, as identified in the analysis of the proposed project scenarios. Similarly, construction could introduce invasive, non-native plants and could result in bird mortality or nest failure into the project area and could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. This alternative would also permanently impact federally protected wetlands. However, with mitigation measures, these impacts would be reduced to a less-than-significant level. Therefore, the impact to special-status animals, riparian habitat or other sensitive natural community, fish or wildlife, and federally protected wetlands would be equal to the proposed project scenarios (see Impacts BIO-1, 2, 3, and 4).

(4) Cultural Resources

As described in *Section V.D, Cultural Resources*, of this Draft EIR, excavation and grading activities associated with construction of either of the two proposed project scenarios may significantly impact archaeological or resources as defined in Public Resources Code Section 21074, a unique paleontological resource or site, a unique geologic feature, or d human remains. The Existing Levee Footprint 2050 Sea Level Rise Alternative would not cause a substantial adverse change in the significance of historical or archaeological resources, with implementation of mitigation measures, as identified for the proposed project scenarios. Similarly, this alternative would not directly or indirectly destroy a unique paleontological resources or geological features, nor disturb human remains, including those interred outside of formal cemeteries, and it would not cause an adverse change in significance of tribal cultural resources with implementation of mitigation measures. Therefore, the impacts for this alternative would be equal to the proposed project scenarios (see Impacts CULT-1, 2, 3, and 4) and would be mitigated to less than significant with the recommended mitigation measures.

(5) Soils, Geology, and Seismicity

As described in *Section V.E, Soils, Geology, and Seismicity*, of this Draft EIR, the creation of temporary slopes, excavation, and stockpiling during construction of either of the two proposed project scenarios may significantly impact settlement and differential settlement. Additionally, potential operational impacts related to expansive and corrosive soils and ground shaking would be significant because the site fill is corrosive and all structures in the San Francisco Bay Area could be affected by ground shaking in the event of an earthquake on regional active faults. Similar to the proposed project scenarios, impacts including the potential damage to structures or property and exposure to major seismic hazards, could occur under the Existing Levee Footprint 2050 Sea Level Rise Alternative (see Impacts GEO-1 and 2). These impacts would be equal to the proposed project scenarios and with implementation of mitigation measures would be reduced to a less-than-significant level.

(6) Greenhouse Gas Emissions

As described in *Section V.F, Greenhouse Gas Emissions*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to greenhouse gas emissions. The Existing Levee Footprint 2050 Sea Level Rise Alternative would also not result in any significant greenhouse gas emissions impacts during construction or operation of the project. Similar to the proposed project scenarios, this alternative would not exceed thresholds of significance identified in the City of Foster City's Climate Action Plan, nor would it conflict with the City's Climate Action Plan. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(7) Hazards and Hazardous Materials

As described in *Section V.G, Hazards and Hazardous Materials*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to the accidental release of hazardous materials into the environment and interference with an adopted emergency response plan or emergency evacuation plan would be significant because hazardous material such as oils, grease, and fuels for construction vehicles and equipment would be transported and used on-site for proposed construction activities. Similarly, the disturbance and reuse of soil potentially impacted with hazardous materials during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. Additionally, the proposed levee improvements in areas of trails/fire access roads could interfere with the use of these trails/fire access roads for emergency response and evacuation purposes during construction. Implementation of the Existing Levee Footprint 2050 Sea Level Rise Alternative could result in an accidental release of hazardous materials (e.g., oils, grease, and fuels) during project construction, similar to the proposed project scenarios. This alternative could also interfere with the use of the emergency response/evacuation routes, as identified with the implementation of the project (see Impacts HAZ-1 and 2). However, with implementation of the mitigation measures, the impacts would be reduced to a less-than-significant level. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(8) Hydrology and Water Quality

As described in *Section V.H, Hydrology and Water Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to degradation of water quality would be significant due to construction activities that would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. The Existing Levee Footprint 2050 Sea Level Rise Alternative could result in degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay, as identified in the analysis of the proposed project scenarios (see Impact HYD-1). However, with implementation of Mitigation Measures HYD-1a and 1b, this impact would be reduced to a less-than-significant level. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(9) Land Use

As described in *Section V.I, Land Use*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to land use. Implementation of the Existing Levee Footprint 2050 Sea Level Rise Alternative would result in the continuation of existing land uses on the project site, which is currently vacant. As would be the case under the proposed project scenarios, this alternative would not physically divide the existing community, conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, nor conflict with habitat conservation plans. Thus, this alternative would not result in any significant land use impacts, similar to the proposed project scenarios.

(10) Noise and Vibration

As described in *Section V.J, Noise and Vibration* of this Draft EIR, the two proposed project scenarios would significantly impact nearby receptors during project construction. Construction activities would generate noise levels and vibration that would exceed standards established in the Foster City Municipal Code or the Federal Transit Administration's recommended vibration thresholds. Construction activity would occur under the Existing Levee Footprint 2050 Sea Level Rise Alternative and therefore noise and vibration impacts identified under the proposed project scenarios would also occur under this alternative. Impacts include: (1) noise from hauling trucks on area roadways, (2) noise from hauling trucks along the levee; (3) the operation of construction equipment on the project site and in the staging areas that could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City of Foster City Municipal Code regulations, and that could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving); and (4) exposure of nearby receptors to excessive vibration during construction (see Impacts NOISE-1, 2, 3, and 4). With implementation of mitigation measures, Impacts NOISE-1, 2, and 4 would be reduced to a less-than-significant level. However, the operation of construction equipment on the project site and staging areas (Impact NOISE-3) would remain significant and unavoidable, similar to the proposed project scenarios. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(11) Traffic and Transportation

As described in *Section V.K, Traffic and Transportation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The Existing Levee Footprint 2050 Sea Level Rise Alternative would result in temporary disruption to pedestrian and bicycle facilities along the Bay Trail during construction (see Impact TRANS-1). However, with implementation of Mitigation Measure TRANS-1, this impact would be reduced to a less-than-significant level. Therefore, the impact of this alternative would be considered equal to the proposed project scenarios.

(12) Recreation

As described in *Section V.L, Recreation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The Existing Levee Footprint 2050 Sea Level Rise Alternative would temporarily reduce the availability and access of the Bay Trail during construction (see Impact REC-1). However, with implementation of Mitigation Measure REC-1, the impact would be reduced to a less-than-significant level. Therefore, the impact of this alternative would be considered equal to the proposed project scenarios because the construction schedule, closure plan, and detour routes would be the same.

3. Horizontal Levee 2050 Sea Level Rise Alternative

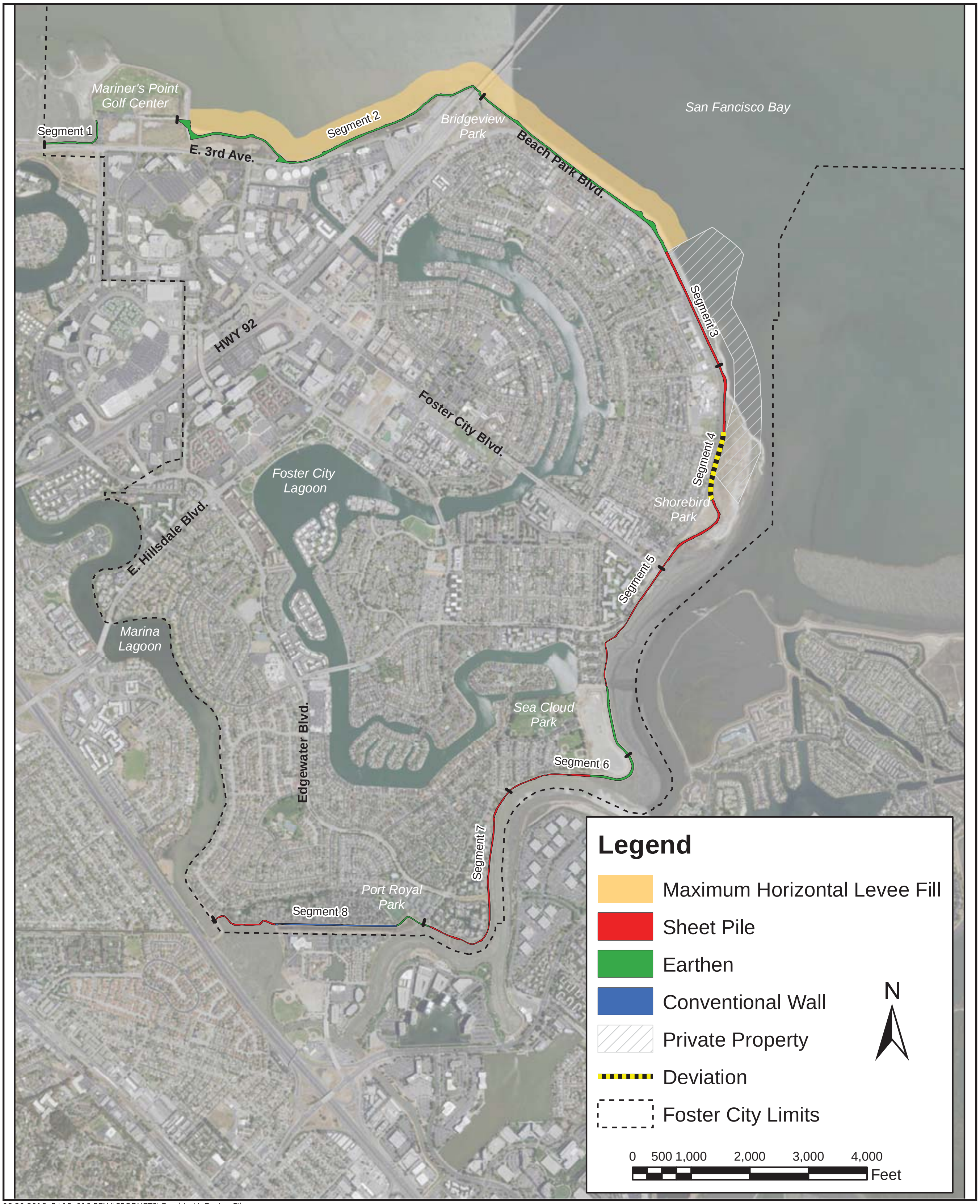
a. Principle Characteristics

As an alternative to the construction of a traditional levee, earthen fill could be placed at much shallower slopes in what is known as a "horizontal levee" or sometimes as an "ecotone slope" (hereafter referred to as "Horizontal Levee") along segment 2. Segments 1 and segments 3 through 8 of the levee would consist of sheet pile floodwall, earthen levee, and conventional floodwall levee improvement types as proposed under the 2050 Sea Level Rise project scenario because a Horizontal Levee would not be feasible in these locations. The most feasible location is along segment 2 because there is significant wave action, sufficient space for the amount of fill required, and the Horizontal Levee would not cross onto private property.

Under this alternative, rather than sloping the levee embankment at 2:1 (horizontal to vertical), fill would be sloped at 30:1 or roughly a slope of 0.03–0.04-foot per foot. The benefit of such a gentle slope, which would be vegetated to provide various habitats, is to help dissipate wave energy and significantly reduce the maximum wave run-up elevation on the vertical or near vertical shoreline barrier. A conceptual plan of a Horizontal Levee is shown in Figures VI-1 and VI-2. Since the required increases in elevation for much of the Foster City levee system are predicated on protection against wave run-up, offshore marsh creation (that would be created as part of the Horizontal Levee system) has the potential to result in lower levee elevations.

Construction of this alternative would require placing approximately 1 million cubic yards of clean fill into the bay that would extend out into the existing bay water approximately 400 feet beyond the existing shoreline and cover an area of about 100 acres. There is no specifically identified source of this much transportable clean fill. Further, because of the shallow water off the shore of Foster City and continuous tidal bay water level fluctuations, it is unlikely that the fill material could be transported to the site by barge and would have to be delivered by truck.

Approximately 50,000 20-cubic-yard truck trips would be required to transport 1 million cubic yards to the project staging areas. Smaller trucks (approximately 10-cubic-yard capacity) would be used to transport the soil material from the staging area to the levee. Preliminary engineering estimates indicate it would take approximately 6 years to complete the required 100,000 10-cubic-yard capacity truck trips and construct the Horizontal Levee (for comparison, estimates for proposed project are 1.5–2 years for 2050 Sea Level Rise project scenario and 2–2.5 years for 2100 Sea Level Rise project scenario). The time required for the movement of this quantity of fill would exceed schedule constraints on the project. In addition, preliminary engineering estimates indicate that this alternative would more than double project construction cost over the proposed project 2050 Sea Level Rise project scenario.



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Source: Schaaf & Wheeler, 2016

Figure VI-1
Foster City Levee Protection Planning and Improvements Project EIR
Horizontal Levee 2050 Alternative

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Source: Schaaf & Wheeler, 2016

Figure VI-2
Foster City Levee Protection Planning and Improvements Project EIR
Horizontal Levee 2050 Alternative Close Up

TABLE VI-2 LEVEE/FLOODWALL ELEVATIONS

Segment	Existing Levee Elevation	2050 Sea Level Rise project scenario	2100 Sea Level Rise project scenario	2050 Horizontal Levee Alternative	FEMA Freeboard Alternative
1	>13	15	18.5	15	14
2	12–13	19	22	13.5	16.5
3	12–13	18	21.5	18	16
4	11–12	13.5–18	16–21.5	13.5–18	12.5–16
5	12	13.5	16	13.5	12.5
6	12	13.5	16	13.5	12.5
7	12–13	13.5	16	13.5	12.5
8	12–13	13.5	16	13.5	12.5

Note: All elevations are shown in Feet NAVD 88.
Source: Schaaf & Wheeler, 2016.

The proposed project 2050 Sea Level Rise project scenario does not involve placing any fill in the bay and this alternative would include extensive fill placement in the bay. However, the Horizontal Levee alternative elevations along segment 2 would be lower than the 2050 Sea Level Rise project scenario by approximately 5.5 feet at an elevation of 13.5 feet. Table VI-2 shows a comparison of levee elevations across each project scenario and the Horizontal Levee 2050 Sea Level Rise Alternative.

A Horizontal Levee improvement type is not feasible for segment 1 because only earthen fill is necessary to meet 2050 Sea Level Rise project scenario. Additionally, the Horizontal Levee concept would not be used for segments 3 and 4 under this alternative as this improvement would cross on to private property. Lastly, the Horizontal Levee concept is not applicable for areas of the levee adjacent to Belmont Slough (segments 5 through 8) because there is no significant wave action and Horizontal Levees do not provide protection against stillwater storm surge. Therefore, segment 2 is the only feasible location for the Horizontal Levee improvement type.

b. Relationship with Project Objectives

With regard to meeting project objectives, it is unclear whether a Horizontal Levee would meet current FEMA standards and allow the City to retain FEMA levee accreditation as this type of flood protection system has never been approved by FEMA. There would be substantial risk that upon completion of detailed engineering design (FEMA would not consider the project for approval without detailed design), that FEMA would reject this approach and the current FEMA accreditation status would not be continued. Further, the increased construction duration would also not meet the schedule required to retain FEMA accreditation. If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San Mateo could be placed within a FEMA-designated Special Flood Hazard Area due to the risks associated with levee overtopping. Therefore, this approach may not meet the basic project objectives (1 and 2).

It is uncertain how adaptable a Horizontal Levee is to sea level rise, as this type of levee has not been constructed and tested in the San Francisco Bay Area on high energy shorelines. Concepts that have been tested, including restoration of existing salt ponds within a Horizontal Levee, would not be available for Foster City since there are no salt ponds adjacent to the shoreline. Placing fill out into open bay water has never been attempted (or permitted) in the past.

It is possible that in the future additional fill would be required (both height of fill and its extent into the bay) to maintain flood protection with rising sea level. If sea level rises as predicted, it would be necessary to cover over again all the developed biotic habitat with fill in the future. Therefore, it is uncertain whether objective 3 would be achieved, which specifies that the project should be able to provide protection from current anticipated sea level rise, as well as flexibility to adapt to increased levels of protection in the future as needed. Additionally, prime areas for windsurfers and kite surfers would be taken away along segment 2 because the gradual slope of the Horizontal Levee would extend into the bay resulting in shallower depths along the shoreline (therefore not satisfying objective 4).

This alternative would substantially increase short-term impacts to sensitive habitats such as jurisdictional waters of the U.S. and state (including wetlands) on the bayside of the existing levee and result in direct impacts to fully tidal waters (and would therefore not satisfy objective 5 or 7).

The Horizontal Levee 2050 Sea Level Rise Alternative would achieve one of the seven key objectives of the proposed project, including those related to:

- Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the existing levee (objective 6).

c. Analysis of the Horizontal Levee 2050 Sea Level Rise Alternative

The potential impacts of the Horizontal Levee 2050 Sea Level Rise Alternative are described below.

(1) Aesthetics and Shade and Shadow

As described in *Section V.A, Aesthetics and Shade and Shadow*, of this Draft EIR, potential impacts of the two proposed project scenarios related to the visual character and scenic resources would be significant and unavoidable because the increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (under both project scenarios), and may impact scenic vistas of the Belmont Hills from Sea Cloud Park (under the 2100 Sea Level Rise project scenario).

The aesthetic impacts of the Horizontal Levee 2050 Sea Level Rise Alternative would be the same as the 2050 Sea Level Rise project scenario for segment 4. As a result, the same impact (see Impact AES-1) identified for the 2050 Sea Level Rise project scenario would apply to this alternative as shown in Table VI-1.

Within segment 2, the Horizontal Levee would be 5.5 feet lower than the 2050 Sea Level Rise project scenario. As a result, the visual impacts within this segment would be incrementally less than project's already less-than-significant impact.

(2) Air Quality

As described in *Section V.B, Air Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to fugitive dust and exhaust emissions would be significant due to project construction activities including the use of off-road equipment and on-road vehicles. The Horizontal Levee 2050 Sea Level Rise Alternative would temporarily result in impacts to air quality due to construction. Under this alternative, construction activity and increases in vehicle trips associated with transporting additional fill would occur. Similar to the proposed project scenarios, this alternative would result in significant operational impacts related to fugitive dust and exhaust emissions standards during project construction (see Impact AIR-1, 2, and 3). Whereas the proposed project scenarios would require approximately 34,000–46,000 cubic yards of fill (2050 Sea Level Rise project scenario) and 150,000–162,000 cubic yards (2100 Sea Level Rise project scenario), the horizontal levee improvement type would require approximately 1 million cubic yards of fill. This substantial increase in fill would require more truck trips and result in a longer construction schedule and greater emissions during construction compared with the project scenarios, substantially increasing the severity of impacts related to emissions.

(3) Biological Resources

As described in *Section V.C, Biological Resources*, of this Draft EIR, the two proposed project scenarios may significantly impact special-status animal species, federally protected wetlands, fish and wildlife movement, wildlife corridors, or wildlife nursery sites would be significant during project construction. Construction activities would modify nesting or foraging habitat for Ridgway's rail, salt marsh harvest mouse, and California black rail and introduce invasive, non-native plants. Additionally, project construction would permanently impact portions of federally protected wetlands and involve vegetation removal during the bird nesting season that could result in bird mortality or nest failure, and promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. Lastly, the use of sheet pile walls at the top of the levee would restrict movements of wildlife. The

Horizontal Levee 2050 Sea Level Rise Alternative would require significant filling of portions of the bay along the Foster City shoreline with imported soil material (likely dredge spoils), resulting in significant impacts to federally protected wetlands and waters of the U.S. and to wildlife populations in the project area. There are no areas along the levee alignment in segment 2 that currently provide suitable habitat for federally-listed endangered Ridgway's rail or salt marsh harvest mouse, except one area of wetland on the inboard side of the levee harbors Palustrine Emergent Wetland that may provide winter foraging habitat for the state-listed threatened California black rail.

The Horizontal Levee 2050 Sea Level Rise Alternative would result in substantially more fill in wetlands and/or waters of the U.S. than the project scenarios. Implementation of the Horizontal Levee 2050 Sea Level Rise Alternative would fill and eliminate approximately 100 acres of federally protected wetlands and/or waters of the U.S. Project scenarios would result in fill of up to 0.48 acres of wetlands/waters under the 2050 Sea Level Rise project scenario, and an estimated 1.15 acres under the 2100 Sea Level Rise project scenario. Implementation of mitigation measures, including Mitigation Measure BIO-3 to address impacts to wetlands and waters of the U.S., would reduce these potential impacts to a less-than-significant level. As a Horizontal Levee has not been implemented in the San Francisco Bay Area on a high-energy shoreline such as this, mitigation requirements for the substantial fill in wetlands and/or waters of the U.S. associated with such a project are an unknown.

As with the proposed project scenarios, construction could introduce invasive, non-native plants into the project area, and could result in nest failure for nesting bird species (see Impacts BIO-2 and 4a). Such impacts would be greater under this alternative as a result of covering a much wider area. Both the project scenarios and the Horizontal Levee 2050 Sea Level Rise Alternative could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and aquatic areas downstream (see Impact BIO-4b), but these impacts would be much more substantial due to the large fill volumes necessary for the Horizontal Levee. An additional negative aspect of implementing the Horizontal Levee 2050 Sea Level Rise Alternative is that the vast quantities of fill or dredge spoils necessary for creating the Horizontal Levee could redirect needed fill or dredge spoils necessary for habitat restoration projects already underway or planned in other parts of the San Francisco Bay.

Despite the adverse short-term biological impacts and requirements for mitigation as a result of implementing this alternative, a Horizontal Levee could result in long-term ecological benefit to the health of San Francisco Bay. Under the proposed project scenarios, rising sea levels in the bay would be expected to reduce the inventory of salt marsh and associated habitat for listed species along the fringes of the bay as these areas are inundated in coming decades. A horizontal slope levee along the Foster City shoreline could provide salt marsh habitat for wetland species, including suitable habitat for listed species such as Ridgway's rail, salt marsh harvest mouse, and California black rail, well into the future.

These long-term benefits of the Horizontal Levee would come with a short-term cost in terms of biological impacts, as the large amount of fill required for construction of the Horizontal Levee over a wide area would impact a large acreage of wetlands and/or waters of U.S. As the Horizontal Levee 2050 Sea Level Rise Alternative would apply only to levee segment 2, no nesting habitat for Ridgway's rail (nesting habitats were identified in segments 5 through 8) or habitats suitable for salt marsh harvest mouse would be impacted. The net result of implementation of the Horizontal Levee over the long-term may be improved future conditions for Ridgway's rail and salt marsh harvest mouse taking into consideration inundation of habitats for these species that are anticipated with future sea level rise. Construction of the horizontal levee also has the potential to cause short-term impacts to populations of listed fish species that migrate through the project area at certain times of the year and to result in short-term impacts to Essential Fish Habitat. However, in the long-term, future conditions for fish populations are likely to be better than they would be with increased sea levels in the absence of the Horizontal Levee because the rise in sea level would reduce the amount of shallow bottom fish habitat. Therefore, the impact to special-status animals, riparian habitat or other sensitive natural community, fish or wildlife, and federally protected wetlands for this alternative would be less severe than the proposed project scenarios.

(4) Cultural Resources

As described in *Section V.D, Cultural Resources*, of this Draft EIR, excavation and grading activities associated with construction of either of the two proposed project scenarios may significantly impact archaeological or resources as defined in Public Resources Code Section 21074, a unique paleontological resource or site, a unique geologic feature, or d human remains. The Horizontal Levee 2050 Sea Level Rise Alternative would not cause a substantial adverse change in the significance of historical or archaeological resources, with implementation of mitigation measures, as identified for the proposed project scenarios. Similarly, this alternative would not directly or indirectly destroy a unique paleontological resources or geological features, nor disturb human remains, including those interred outside of formal cemeteries, and it would not cause an adverse change in significance of tribal cultural resources with implementation of mitigation measures (see Impacts CULT-1, 2, 3, and 4). Due to the larger footprint and greater potential for discovering archaeological or paleontological resources or geological features, the impacts for this alternative would be incrementally greater than the proposed project scenarios.

(5) Soils, Geology, and Seismicity

As described in *Section V.E, Soils, Geology, and Seismicity*, of this Draft EIR, the creation of temporary slopes, excavation, and stockpiling during construction of either of the two proposed project scenarios may significantly impact settlement and differential settlement. Additionally, potential operational impacts related to expansive and corrosive soils and ground shaking would be significant because the site fill is corrosive and all structures in the San Francisco Bay Area could be affected by ground shaking in the event of an earthquake on regional active faults. The Horizontal Levee 2050 Sea Level Rise Alternative would require construction and the placement of fill in the bay. Similar to the proposed project scenarios, impacts including the potential damage to structures or property and exposure to major seismic hazards, could occur (see Impacts GEO-1 and 2). Due to the larger footprint, this alternative would result in more severe impacts than the proposed project scenarios but with implementation of mitigation measures, would be reduced to a less-than-significant level.

(6) Greenhouse Gas Emissions

As described in *Section V.F, Greenhouse Gas Emissions*, of this Draft EIR, there are no potentially significant impacts related to greenhouse gas emissions. Similar to the proposed project scenarios, this alternative would not exceed thresholds of significance identified in the City of Foster City's Climate Action Plan, nor would it conflict with the City's Climate Action Plan. The Horizontal Levee 2050 Sea Level Rise Alternative could result in new greenhouse gas emissions impacts during construction of the project because of the increased truck trips associated with fill import (negligible GHG emissions would occur during the operational life of the project). Though not quantified for this alternatives analysis, it is possible that the GHG construction emissions associated with the increased truck trips required to import the fill material to construct the horizontal levee could exceed the BAAQMD threshold when construction emissions are amortized over the life of the project. Therefore, this alternative would be considered more impactful than the other proposed project scenarios due to the substantial increase in fill that would require more truck trips and result in higher emissions during construction.

(7) Hazards and Hazardous Materials

As described in *Section V.G, Hazards and Hazardous Materials*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to the accidental release of hazardous materials into the environment and interference with an adopted emergency response plan or emergency evacuation plan would be significant because hazardous material such as oils, grease, and fuels for construction vehicles and equipment would be transported and used on-site for proposed construction activities. Similarly, the disturbance and reuse of soil potentially impacted with hazardous materials during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. Additionally, the proposed levee improvements in areas of trails/fire access roads could interfere with the use of these trails/fire access roads for emergency response and evacuation purposes during construction. Implementation of the

Horizontal Levee 2050 Sea Level Rise Alternative could result in an accidental release of hazardous materials (e.g., oils, grease, and fuels) during project construction, similar to the proposed project scenarios. This alternative could also interfere with the use of the emergency response/evacuation routes, identified in the implementation of the project (see Impacts HAZ-1 and 2). However, with implementation of the mitigation measures, the impacts would be reduced to a less-than-significant level. Since this alternative would require construction activities to take place directly in the bay, the impacts are considered more severe than the proposed project scenarios but they could still be reduced to a less-than-significant level.

(8) Hydrology and Water Quality

As described in *Section V.H, Hydrology and Water Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to degradation of water quality would be significant due to construction activities that would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. The Horizontal Levee 2050 Sea Level Rise Alternative could result in shoreline erosion and erosion of Bird Island and degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay, as identified in the analysis of the proposed project scenarios (see Impact HYD-1). However, with implementation of Mitigation Measures HYD-1a and 1b, this impact would be reduced to a less-than-significant level. Since this alternative would require construction activities to take place directly in the bay, the impacts are considered more severe than the proposed project scenarios.

(9) Land Use

As described in *Section V.I, Land Use*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to land use. Implementation of the Horizontal Levee 2050 Sea Level Rise Alternative would result in the continuation of existing land uses on the project site, which is currently vacant. As would be the case under the proposed project scenarios, this alternative would not physically divide the existing community, conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, nor conflict with habitat conservation plans. Thus, this alternative would not result in any land use impacts, similar to the proposed project scenarios.

(10) Noise and Vibration

As described in *Section V.J, Noise and Vibration* of this Draft EIR, the two proposed project scenarios would significantly impact nearby receptors during project construction. Construction activities would generate noise levels and vibration that would exceed standards established in the Foster City Municipal Code or the Federal

Transit Administration's recommended vibration thresholds. Construction activity would occur under the Horizontal Levee 2050 Sea Level Rise Alternative and therefore, impacts identified under the proposed project scenarios would occur under this alternative. Impacts include: (1) noise from hauling trucks on area roadways, (2) noise from hauling trucks along the levee; (3) the operation of construction equipment on the project site and in the staging areas that could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City of Foster City Municipal Code regulations, and that could generate substantial increases in noise levels or intermittent periods when certain construction activities occur (e.g., pile driving); and (4) exposure of nearby receptors to excessive vibration during construction. With implementation of mitigation measures, Impacts NOISE-1, 2, and 4 would be reduced to a less-than-significant level; however, the operation of construction equipment on the project site and staging areas (NOISE-3) would remain significant and unavoidable, similar to the proposed project scenarios. This alternative would result in more severe impacts than the proposed project scenarios due to the substantial increase in fill that would require more truck trips. This would likely result in exposure to noise from hauling trucks and excessive vibration over a longer period of time due to a longer construction schedule.

(11) Traffic and Transportation

As described in *Section V.K, Traffic and Transportation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The Horizontal Levee 2050 Sea Level Rise Alternative would result in temporary disruption to pedestrian and bicycle facilities along the Bay Trail during construction (see Impact TRANS-1). Unlike the proposed project scenarios, the total fill volume would be almost 22–29 times greater; therefore, the number of daily truck trips would be much higher. The estimated daily truck trips would range from 0–406 depending on the construction segment, averaging around 230 daily trucks. Most roadway segments would likely not be impacted, but there could be a few segments where added truck traffic could represent up to 15 percent of daily traffic. However, with implementation of Mitigation Measure TRANS-1, this impact would be reduced to a less-than-significant level. This alternative would be considered incrementally more impactful than the other proposed project scenarios due to the increase in truck trips.

(12) Recreation

As described in *Section V.L, Recreation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The Horizontal Levee 2050 Sea Level Rise Alternative would temporarily reduce the availability and access of the Bay Trail during construction (see Impact REC-1). However, with implementation of Mitigation Measure REC-1, the impact would be reduced to a less-than-significant level. This alternative would be considered more impactful than the other proposed project scenarios because the closure plan and detour routes would be in effect over a longer construction schedule.

4. FEMA Freeboard Alternative

a. Principle Characteristics

The FEMA Freeboard Alternative assumes the project site would be located within the footprint of the approximately 43,000-linear-foot (8 miles) existing levee system with a slight deviation to the west within segment 4 similar to the proposed project scenarios. This alternative would have the same levee improvement types and locations as the proposed project's 2050 Sea Level Rise project scenario but the top elevation for the levee/floodwall would be lower as it would only meet the elevations necessary to retain FEMA accreditation. The current levee ranges from 11–13 feet and it would range from 12.5–16.5 feet under this alternative (under the 2050 Sea Level Rise project scenario it would increase from 13.5–19 feet as shown in Table VI-2). The wide elevation range of the FEMA Freeboard Alternative is a result of the transition from the open San Francisco Bay which has significant wave run-up (energy associated with waves) requiring a higher levee to the mouth of the Belmont Slough, where there is no significant wave run-up resulting in a lower levee elevation. This alternative would only require 7,000–8,000 cubic yards of fill to raise the elevation of the levee.

b. Relationship with Project Objectives

The FEMA Freeboard Alternative would not provide protection from current anticipated sea level rise predictions (objective 3). However, this alternative would achieve six of the seven key objectives of the proposed project, including those related to:

- Meet current FEMA standards (objective 1).
- Expedite permitting and construction of levee improvements necessary to retain FEMA levee accreditation before such accreditation is lost (objective 2).
- Maintain public access and recreational opportunities (objective 4).
- Minimize and/or avoid impacts to sensitive habitats such as jurisdictional waters of the U.S. and State (including wetlands) on the bayside of the existing levee (objective 5).
- Minimize impacts to sensitive habitats such as jurisdictional waters of the U.S. and State on the landward side of the existing levee (objective 6).
- Avoid direct impacts to fully tidal waters and wetlands occupied by special-status species such as federal and State-listed species to the maximum extent feasible (objective 7).

c. Analysis of the FEMA Freeboard Alternative

The potential impacts of the FEMA Freeboard Alternative are described below.

(1) Aesthetics and Shade and Shadow

As described in *Section V.A, Aesthetics and Shade and Shadow*, of this Draft EIR, potential impacts of the two proposed project scenarios related to the visual character and scenic resources would be significant and unavoidable because the increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (under both project scenarios), and may impact scenic vistas of the Belmont Hills from Sea Cloud Park (under the 2100 Sea Level Rise project scenario). Unlike the 2050 Sea Level Rise project scenario, the levee elevation would only be 12.5–16 feet at Shorebird Park in contrast with 2050 Sea Level Rise project scenario (elevation of 13.5–18 feet) and 2100 Sea Level Rise project scenario (elevation of 16–21.5 feet). Therefore, the FEMA Freeboard Alternative would result in lesser impacts than the proposed project scenarios (as described in Impact AES-1).

In Sea Cloud Park, the increase in elevation for this alternative would match that of 2050 Sea Level Rise project scenario with an elevation of 13.5 feet; therefore, the impact on visual quality and scenic vistas would be identical to 2050 Sea Level Rise project scenario. This impact would be incrementally less than the 2100 Sea Level Rise project scenario that has an elevation of 16 feet and blocks views of the Belmont Hills. Although this impact would be less than significant in Sea Cloud Park (segment 6), this impact would remain significant and unavoidable in Shorebird Park (segment 4).

(2) Air Quality

As described in *Section V.B, Air Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to fugitive dust and exhaust emissions would be significant due to project construction activities including the use of off-road equipment and on-road vehicles. The FEMA Freeboard Alternative would temporarily pose impacts on air quality due to construction. Under this alternative, construction activity and increases in vehicle trips associated with transporting additional fill would occur. Similar to the proposed project scenarios, this alternative would result in significant impacts related to fugitive dust and exhaust emissions standards during project construction (see Impacts AIR-1, 2, and 3). Whereas the proposed project scenarios would require approximately 34,000–46,000 cubic yards of fill (2050 Sea Level Rise project scenario) and 150,000–162,000 cubic yards (2100 Sea Level Rise project scenario), the FEMA Freeboard Alternative would only require 7,000–8,000 cubic yards of fill. Therefore, the mitigation measures would reduce the alternative's impact to a less-than-significant level. This decrease in fill would require fewer truck trips and result in a shorter construction schedule and fewer emissions during construction compared with the project scenarios. As a result, this alternative would result in less severe air quality impacts compared to the proposed project.

(3) Biological Resources

As described in *Section V.C, Biological Resources*, of this Draft EIR, the two proposed project scenarios may significantly impact special-status animal species, federally protected wetlands, fish and wildlife movement, wildlife corridors, or wildlife nursery sites would be significant during project construction. Construction activities would modify nesting or foraging habitat for Ridgway's rail, salt marsh harvest mouse, and California black rail and introduce invasive, non-native plants. Additionally, project construction would permanently impact portions of federally protected wetlands and involve vegetation removal during the bird nesting season that could result in bird mortality or nest failure, and promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. Lastly, the use of sheet pile walls at the top of the levee would restrict movements of wildlife. The FEMA Freeboard Alternative would require construction activities that would result in significant impacts to special-status animal specifies including the Ridgway's rail, salt marsh harvest mouse, and California black rail, as identified in the analysis of the proposed project scenarios. Similarly, construction could introduce invasive, non-native plants and could result in bird mortality or nest failure into the project area and could promote erosion and allow elevated levels of sediment to wash into adjacent wetlands and into aquatic areas downstream. This alternative would also permanently impact federally protected wetlands. However, with mitigation measures, these impacts would be reduced to a less-than-significant level. Therefore, the impact to special-status animals, riparian habitat or other sensitive natural community, fish or wildlife, and federally protected wetlands would be equal to the proposed project scenarios (see Impacts BIO-1, 2, 3, and 4).

(4) Cultural Resources

As described in *Section V.D, Cultural Resources*, of this Draft EIR, excavation and grading activities associated with construction of either of the two proposed project scenarios may significantly impact archaeological or resources as defined in Public Resources Code Section 21074, a unique paleontological resource or site, a unique geologic feature, or d human remains. The FEMA Freeboard Alternative would not cause a substantial adverse change in the significance of historical or archaeological resources, with implementation of mitigation measures, as identified for the proposed project scenarios. Similarly, this alternative would not directly or indirectly destroy a unique paleontological resources or geological features, nor disturb human remains, including those interred outside of formal cemeteries, and it would not cause an adverse change in significance of tribal cultural resources with implementation of mitigation measures. Therefore, the impacts for this alternative would be equal to the proposed project scenarios (see Impacts CULT-1, 2, 3, and 4) and would be mitigated to a less-than-significant level with the recommended mitigation measures.

(5) Soils, Geology, and Seismicity

As described in *Section V.E, Soils, Geology, and Seismicity*, of this Draft EIR, the creation of temporary slopes, excavation, and stockpiling during construction of either of the two proposed project scenarios may significantly impact settlement and differential settlement. Additionally, potential operational impacts related to expansive and corrosive soils and ground shaking would be significant because the site fill is corrosive and all structures in the San Francisco Bay Area could be affected by ground shaking in the event of an earthquake on regional active faults. Similar to the proposed project scenarios, impacts including the potential damage to structures or property and exposure to major seismic hazards, could occur under the FEMA Freeboard Alternative (see Impacts GEO-1 and 2). As a result, this alternative would result in equal impacts to the proposed project scenarios and with implementation of mitigation measures would be reduced to a less-than-significant level.

(6) Greenhouse Gas Emissions

As described in *Section V.F, Greenhouse Gas Emissions*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to greenhouse gas emissions. The FEMA Freeboard Alternative would not result in any significant greenhouse gas emissions impacts during construction or operation of the project. Similar to the proposed project scenarios, this alternative would not exceed thresholds of significance identified in the City of Foster City's Climate Action Plan, nor would it conflict with the City's Climate Action Plan. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(7) Hazards and Hazardous Materials

As described in *Section V.G, Hazards and Hazardous Materials*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to the accidental release of hazardous materials into the environment and interference with an adopted emergency response plan or emergency evacuation plan would be significant because hazardous material such as oils, grease, and fuels for construction vehicles and equipment would be transported and used on-site for proposed construction activities. Similarly, the disturbance and reuse of soil potentially impacted with hazardous materials during project construction could result in exposure of construction workers, the public, and/or the environment to hazardous materials. Additionally, the proposed levee improvements in areas of trails/fire access roads could interfere with the use of these trails/fire access roads for emergency response and evacuation purposes during construction. Implementation of the FEMA Freeboard Alternative could result in an accidental release of hazardous materials (e.g., oils, grease, and fuels) during project construction, similar to the proposed project scenarios. This alternative could also interfere with the use of the emergency response/evacuation routes, as identified with the implementation of the project (see Impacts HAZ-1 and 2). However, with implementation of the mitigation measures, the impacts would be reduced to a less-than-significant level. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(8) Hydrology and Water Quality

As described in *Section V.H, Hydrology and Water Quality*, of this Draft EIR, potential construction impacts of the two proposed project scenarios related to degradation of water quality would be significant due to construction activities that would involve disturbance and exposure of soils through removal of existing pavement and vegetative cover, excavation for construction of concrete flood wall bases, and placement and grading of fill material to raise the levee. These activities would result in exposure of soil to runoff, potentially causing erosion and entrainment of sediment in the runoff. The FEMA Freeboard Alternative could result in degradation of water quality in Belmont Slough, the Foster City Lagoon, and San Francisco Bay, as identified in the analysis of the proposed project scenarios (see Impact HYD-1). However, with implementation of Mitigation Measures HYD-1a and 1b, this impact would be reduced to a less-than-significant level. Therefore, the impacts of this alternative would be considered equal to the proposed project scenarios.

(9) Land Use

As described in *Section V.I, Land Use*, of this Draft EIR, neither of the two project scenarios would result in potentially significant impacts related to land use. Implementation of the FEMA Freeboard Alternative would result in the continuation of existing land uses on the project site, which is currently vacant. As would be the case under the proposed project scenarios, this alternative would not physically divide the existing community, conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project, nor conflict with habitat conservation plans. Thus, this alternative would not result in any significant land use impacts, similar to the proposed project scenarios.

(10) Noise and Vibration

As described in *Section V.J, Noise and Vibration* of this Draft EIR, the two proposed project scenarios would significantly impact nearby receptors during project construction. Construction activities would generate noise levels and vibration that would exceed standards established in the Foster City Municipal Code or the Federal Transit Administration's recommended vibration thresholds. Construction activity would occur under the FEMA Freeboard Alternative and therefore impacts identified under the proposed project scenarios would occur under this alternative. Impacts include: (1) noise from hauling trucks on area roadways; (2) noise from hauling trucks along the levee; (3) the operation of construction equipment on the project site and in the staging areas that could result in the exposure of nearby sensitive receptors to temporary noise levels that conflict with the City of Foster City Municipal Code regulations, and that could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving); and

(4) exposure of nearby receptors to excessive vibration during construction (see Impacts NOISE-1, 2, 3, and 4). With implementation of mitigation measures, Impacts NOISE-1, 2, and 4 would be reduced to a less-than-significant level; however, the operation of construction equipment on the project site and staging areas (Impact NOISE-3) would remain significant and unavoidable, similar to the proposed project scenarios. Therefore, this alternative would be considered just as impactful as the proposed project scenarios.

(11) Traffic and Transportation

As described in *Section V.K, Traffic and Transportation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The FEMA Freeboard Alternative would result in temporary disruption to pedestrian and bicycle facilities along the Bay Trail during construction (see Impact TRANS-1). However, with implementation of Mitigation Measure TRANS-1, this impact would be reduced to a less-than-significant level. Therefore, this alternative would be considered just as impactful as the proposed project scenarios.

(12) Recreation

As described in *Section V.L, Recreation* of this Draft EIR, the two proposed project scenarios may significantly impact existing bicycle and pedestrian facilities during project construction because sections of the Bay Trail would be temporarily closed. The FEMA Freeboard Alternative would temporarily reduce the availability and access of the Bay Trail during construction (see Impact REC-1). However, with implementation of Mitigation Measure REC-1, the impact would be reduced to a less-than-significant level. This alternative would be considered just as impactful as the proposed project scenarios because the construction schedule, closure plan, and detour routes would be the same.

C. ENVIRONMENTALLY-SUPERIOR ALTERNATIVE

CEQA requires the identification of the environmentally superior alternative in an EIR. As shown in Table VI-1, although the No Project/No Build Alternative would have the least environmental impact, it would result in a significant and unavoidable impact related to flooding and water quality and it would not meet the main objective of retaining FEMA levee accreditation. Therefore, the FEMA Freeboard Alternative is considered the environmentally superior alternative because the environmental impacts associated with its implementation would be the lowest of all the scenarios examined (including the proposed project scenarios) and this alternative would meet all project objectives with the exception of providing protection from anticipated sea level rise.

Although the significant and unavoidable impacts related to aesthetics and noise would remain under the FEMA Freeboard Alternative, impacts related to air quality, greenhouse gas emissions, noise, traffic and transportation, and recreation would be incrementally less impactful than the other alternatives because there would be less fill required to raise the levee elevation. This would result in fewer truck trips, a shorter construction schedule, less noise from hauling trucks, and lower emissions during construction.

D. ALTERNATIVES CONSIDERED BUT REJECTED FOR DETAILED ANALYSIS

As part of the design development process as well as the CEQA analysis, the City team considered and assessed multiple project scenarios beyond the two considered as part of the project. Four of these scenarios were selected as alternatives to be considered in detail (CEQA-required No Project/No Build Alternative, the Existing Levee Footprint 2050 Sea Level Rise Alternative, the Horizontal Levee 2050 Sea Level Rise Alternative, and the FEMA Freeboard Alternative) and are described and evaluated earlier in this chapter. Several other scenarios were considered but rejected because they were found to be infeasible and/or did not meet most of the project's stated objectives. Each of these rejected scenarios is briefly described below.

1. Alternative Location

A basic goal of any flood protection project is to protect a specific area from flooding. Therefore, a substantial change in the location of the project (i.e., the flood protection solution) is not possible while still satisfying the basic project objective of providing the target area with flood protection. However, it is possible that the location of the project could be shifted within a relatively narrow band at the bay/upland interface and still provide the desired flood protection.

Moving the location of the levee (either bay side or landward), using similar improvement types to those proposed by the project (i.e., a combination of sheet pile floodwall, conventional floodwall and earthen levee) may reduce temporary construction noise impacts by moving the construction site slightly further away from sensitive residential receptors. However, in general, moving the levee toward the bay would result in more environmental impacts and satisfy fewer project objectives. Moving the levee system toward the bay would cause greater impacts to wetland resources along most segments (not meeting objectives 5 and 7). In some locations, it would move the project out of City-owned property and right-of-way thereby potentially requiring lengthy condemnation proceedings which would not meet the schedule required to retain FEMA accreditation (not meeting objective 2). If FEMA accreditation is not achieved, approximately 17,000 individual properties within Foster City and San Mateo could be placed within a FEMA-designated Special Flood

Hazard Area due to the risks associated with levee overtopping. Moving the levee system landward would encroach on roads in some locations, potentially causing new traffic and access impacts, cause greater impacts to wetland resources along all levee segments (not meeting objective 6). Since shifting the proposed levee location either more towards the bay or landward within the relatively narrow band at the bay/upland interface would, in general, create new and more severe impacts and would not satisfy project objectives, this alternative was rejected for detailed analysis. The currently proposed location was selected in part to maximize avoidance of impacts (e.g., wetlands, sensitive habitats).

2. Earthen Levee Alternative

Approximately 87 percent of the existing levee is an earthen levee (refer to *Chapter III, Project Description* for a detailed description of the earthen levee). Under the 2050 Sea Level Rise project scenario, approximately 12 percent of the existing levee would be improved with earthen levee improvement type and under the 2100 Sea Level Rise project scenario, no earthen levee improvement type would be used. One alternative considered was expanding and raising the existing levee with a similar, but higher and wider, earthen levee for the entire length of the levee alignment. The alignment for this alternative is similar to the proposed project alignment. The wider footprint of the earthen levee would, in some locations, extend the project out of City-owned property and right-of-way potentially requiring lengthy condemnation proceedings not meeting objective 2 and/or encroach on roads, potentially causing new traffic and access impacts. Unlike a Horizontal Levee, which has a more gradual slope of 30:1 (horizontal to vertical), the earthen levee fill would be sloped at 2:1.

In some locations, this levee type may provide specific biotic resource benefits by providing refugia habitat (i.e., a place that provides shelter or protection from danger or distress) for certain species of wildlife (e.g., salt marsh harvest mouse, Ridgway's rail) during storms and/or flood events. Whereas a sheet pile floodwall, which is the primary improvement type proposed by the project, would reduce available refugia (though implementation of Mitigation Measure BIO-3 would reduce this impact to a less-than-significant level). However, this potential biotic resources benefit would be offset by the expanded footprint of the earthen levee that would encroach on more wetland areas. To increase the elevation of the levee, the base of the improved earthen levee would need to be expanded to support additional fill.

Since the crest elevations of the earthen levee would be similar to those of the proposed project, the earthen levee would not substantially reduce aesthetic impacts associated with loss of Bay views, including substantial degradation of the existing visual character and scenic vistas along segment 4 under both project scenarios and segment 6 under the 2100 Sea Level Rise project scenario.

With the exception of providing improved refugia for wildlife, the earthen levee would not reduce identified impacts associated with the proposed project (and would create new and more severe impacts). Further, it would not satisfy project objectives 2, 5, 6, and 7. Therefore, this alternative was rejected for detailed analysis.

3. Movable Floodwall Alternative

It is possible that a movable flood break structure could be constructed that would be lowered under normal conditions, but would rise when needed to provide flood protection. This could be a structure similar to that described in *Chapter III, Project Description* that would be installed at specific locations along the proposed levee to provide emergency egress/fire access (see pages 70–71). These flood barriers deploy automatically, lifted by the power of the rising floodwaters, to provide the desired level of flood protection. They do not require human intervention or power to deploy. The utilization of a movable floodwall would reduce the aesthetic impacts associated with loss of Bay views and the Belmont Hills because the upper part of the structure would be lowered most of the time. The alignment for this alternative is similar to the proposed project scenarios alignment.

Based on preliminary review of this potential alternative, the City's design team considered the use of long runs of these movable flood barriers potentially ineffective because of the variability of flood elevations and wave action along the 8-mile project alignment. Some of the barriers may rise in response to rising stillwater flood levels, while others may be moving up and down in response to wave action resulting in only partial protection. In addition, these movable flood barriers would need to be located where the Bay Trail is now, making the Bay Trail unusable (and potentially dangerous to pedestrians) during storm events and flooding. Further, the initial cost and ongoing maintenance associated with this alternative was determined to far exceed the cost of the other proposed project scenarios. Therefore, this alternative was rejected for detailed analysis.

4. Extended/Realigned Horizontal Levee 2050 Sea Level Rise Alternative

As an alternative to the construction of a traditional levee, earthen fill could be placed at much shallower slopes in what is known as a Horizontal Levee. Rather than sloping the levee embankment at 2:1 (horizontal to vertical), fill would be sloped at 30:1 or roughly a slope of 0.03–0.04-foot per foot. The design and construction methods associated with the Extended/Realigned Horizontal Levee 2050 Sea Level Rise Alternative would be similar to those under the Horizontal Levee 2050 Sea Level Rise Alternative, described above in more detail in subsection B, Alternatives Analyzed in Detail. The main difference is that under the Extended/Realigned Horizontal Levee 2050 Sea Level Rise Alternative, the levee would be realigned closer to the shoreline of segment 4 to protect an approximately 13-acre portion of land on the bayward side of the existing levee (along Beach Park Boulevard between Tarpon Street and Halibut Street). This would result in segments 3 and 4 being constructed as a Horizontal Levee (as opposed to just segment 2 in the Horizontal Levee 2050 Sea Level Rise Alternative). While no specific development of this newly protected portion of land is envisioned under this alternative discussion, the development potential of this property would increase since it would no longer be subject to regular flooding.

The potential benefits, increased adverse impacts, and issues related to feasibility associated with this alternative would be the same as for the Horizontal Levee 2050 Sea Level Rise Alternative, which is described above in detail in subsection B, Alternatives Analyzed in Detail. However, the level of impact would be significantly greater as would the benefits given the Horizontal Levee would include approximately 1.6 million cubic yards of clean fill into the bay that would extend out into the existing bay water approximately 400 feet beyond the existing shoreline and cover an area of about 195 acres under the Extended/Realigned Horizontal Levee 2050 Sea Level Rise Alternative (compared with 100 acres under the Horizontal Levee 2050 Sea Level Rise Alternative). The level of adverse and beneficial effects would nearly twice as much as what is described for the Horizontal Levee 2050 Sea Level Rise Alternative. Additionally, this alternative would encroach on private property, perhaps requiring condemnation proceedings (thereby delaying the project and failing to satisfying objective 2) and could potentially be growth-inducing as it would result in 13 acres being less constrained for development.

This alternative would 1) not satisfy most of the project objectives; 2) would increase environmental impacts in most CEQA topic areas, including potentially inducing growth along the waterfront; and 3) may be infeasible due to extended construction schedule and cost. Therefore, this alternative was rejected for detailed analysis.

5. Horizontal Levee 2100 Alternative

The Horizontal Levee 2100 Alternative (2100 Sea Level Rise) would take a similar approach to flood protection as the Horizontal Levee 2050 Sea Level Rise Alternative (described above in more detail in subsection B, Alternatives Analyzed in Detail) in that it would rely on the Horizontal Levee rather than a traditional levee or sheet pile wall, but would include a higher level of protection, equivalent to the flood protection needed for the predicted 2100 flood hazard. This discussion of the Horizontal Levee 2100 Alternative considers two alignments: 1) a Horizontal Levee that follows the existing levee footprint (but extends into the bay); and 2) a Horizontal Levee that follows an alternative alignment (similar to that described above for the Extended/Realigned Horizontal Levee 2050 Sea Level Rise Alternative).

The Horizontal Levee 2100 Alternative, while similar in concept to the Horizontal Levee 2050 Sea Level Rise Alternative, would require approximately three times as much fill, approximately 3 million cubic yards (the amount of this fill would be highly dependent on accurate sea level rise predictions). The fill would extend approximately 600 feet into the bay. Constructing a Horizontal Levee now that would provide flood protection for predicted 2100 sea level rise would require placing a thick band of fill along the shoreline that would remain dry most of the time for many decades.

The main benefits to this alternative would be related to certain biological resources and aesthetics (similar to the Horizontal Levee 2050 Sea Level Rise Alternative, which is described above in detail in subsection B, Alternatives Analyzed in Detail). However, adverse aesthetics impacts related to the wide band of dry soil placed at the shoreline may offset the benefits of a slightly lower levee structure.

Similar to the Horizontal Levee 2050 Sea Level Rise Alternative, this alternative would not satisfy most of the project objectives. In addition, this alternative would magnify many of the increased environmental impacts related to transport and placement of large quantities of fill described the Horizontal Levee 2050 Sea Level Rise Alternative (subsection B, Alternatives Analyzed in Detail), including those related to truck traffic, air quality, and noise.

Since the potential variation in sea level rise predictions increases with time (i.e., the potential error associated with the 2050 prediction is lower than the 2100 prediction), it was considered too speculative to develop a specific design for 2100 flood protection that could be analyzed in detail at this time. In addition, similar to the Horizontal Levee 2050 Sea Level Rise Alternative, this type of flood protection system has never been approved by FEMA and therefore, there would be substantial risk that upon completion of detailed design (FEMA would not consider the project for approval without detailed design), FEMA would reject this approach. Therefore, there is substantial risk that this approach would not meet the basic project objectives 1 and 2 (meeting current FEMA standards and retaining FEMA levee accreditation).

VII. CEQA REQUIRED ASSESSMENT CONCLUSIONS

As required by the California Environmental Quality Act (CEQA), this chapter discusses the following types of impacts that could result from implementation of the Foster City Levee Protection Planning and Improvements Project (the project): effects found not to be significant, growth-inducing impacts, unavoidable significant environmental impacts, and significant irreversible changes.

A. EFFECTS FOUND NOT TO BE SIGNIFICANT

The scope of the EIR was determined after meetings between department representatives of the City of Foster City involved in project planning and review and consultants for the City. In addition to these meetings, a Notice of Preparation (NOP) was circulated on January 5, 2016, and a public scoping session was held in conjunction with the Planning Commission meeting on February 4, 2016. Written comments received on the NOP were considered in the preparation of the final scope for this document and in the evaluation of the proposed project. Three members of the public provided verbal comments at the Planning Commission hearing on February 4, 2016 in support of the City analyzing a horizontal levee improvement type and the use of softscape design rather than hardscape structure (i.e., walls). In 2016, the City initiated an outreach program to engage and receive input from the community on the levee project. A presentation was given at two separate community meetings held at the City Council Chambers on April 21, 2016 (for the residential community) and May 12, 2016 (for the business community). The City's Public Works Director also met with the Foster City Rotary Club on August 17, 2016. Additionally, the Basis of Design Overview report, prepared by Schaaf & Wheeler, was presented at a City Council hearing on October 17, 2016 and at a community meeting on October 27, 2016 with residents on Beach Park Boulevard where the roadway is to be shifted (for the deviation from the exiting levee along segment 4) thereby eliminating parking on the east side of the roadway.

The environmental topics analyzed in *Chapter V, Setting, Impacts, and Mitigation Measures,* include those upon which the project was determined during the scoping phase to have a significant effect. By contrast, the following topics were excluded from detailed discussion in the EIR because it was determined during the scoping phase that project impacts on these resource areas would not be significant: agriculture and forest resources, mineral resources, population and housing, and public services and utilities. An explanation of why these topics were found not to be significant is briefly discussed below.

1. Agriculture and Forest Resources

The project site is comprised of undeveloped land, shore areas, intertidal waters, and estuaries. There are no agricultural uses - including Prime Farmland, Unique Farmland, or Farmland of Statewide Importance - located on, adjacent to, or near the project site. There are no agricultural zones or Williamson Act-contracted properties near the site. Additionally, there are no forest lands or resources on or in the vicinity of the project site. As a result, the project would not impact agricultural or forest resources.

2. Mineral Resources

No known mineral resources have been identified within or near the project site, and no mineral extraction activities have taken place within or around the project site during recent history. The project site is not designated by the Foster City General Plan or other land use plans as a locally important mineral recovery site. For these reasons, the project's impacts to mineral resources would not be significant and no mitigation measures are required.

3. Population and Housing

The proposed project is to update and improve an approximately 8-mile existing levee system and slight deviation from the existing levee system footprint in order to provide flood protection in accordance with updated FEMA guidelines and to regain FEMA levee accreditation. The proposed project does not include any new residential units, businesses, or roads. The project would therefore not directly induce population growth, either directly or indirectly. Finally, because the site is currently undeveloped, the proposed project would not displace any existing housing or people, and therefore would not necessitate the construction of replacement housing elsewhere. The proposed project would not construct any housing, new or more intensified land uses or infrastructure improvements that could generate new residents.

4. Public Services and Utilities

a. Fire Protection

The Foster City Fire Department (FCFD) provides fire suppression, prevention, life safety, and hazardous material response and containment services for Foster City. The Department participates in joint dispatching with other fire agencies in San Mateo County, in which the closest uncommitted unit responds to emergency calls, regardless of jurisdiction. The FCFD has a current authorized staff of 36 full-time employees and two part-time employees. Staff is composed of 19 firefighters, nine captains, three battalion chiefs, one fire marshal, and two administrative employees. The FCFD consists of nine fire stations in San Mateo, Belmont, and Foster City.

b. Schools

The cities of Foster City and San Mateo are served by the San Mateo-Foster City School District (SMFCSD) and the San Mateo Union High School District (SMUHSD). The SMFCSD operates 20 schools serving San Mateo and Foster City, including 16 elementary schools and four middle schools. The SMUHSD operates six high schools and one continuation high school, providing high school education to the communities of Burlingame, Foster City, Hillsborough, Millbrae, San Mateo, and San Bruno. The SMUHSD operates three high schools that serve households in Foster City: Aragon High School, Hillsdale High School, and San Mateo High School.

c. Parks

The City of Foster City has 24 parks and recreational facilities within the 4 square miles comprising the City. The parks range in size from 0.12 acres to 23.9 acres, and total approximately 113.8 acres. In addition, the City has 212 acres of recreational waterways, for a total of 325.8 acres.[1] Almost all residents live within ¼-mile of a park or a private recreational facility. Five parks are adjacent to the project site: Bridgeview Park, Shorebird Park, Sea Cloud Park, Gateshead Park, and Port Royal Park. Bridgeview Park is a 1.42-acre park southeast of San Mateo Bridge/SR 92 with a planter area and benches. Shorebird Park is a 3.85-acre park on the east side of Beach Park Boulevard near its intersection with Halibut Street. Sea Cloud Park is a 23.9-acre park north of Belmont Slough that features baseball diamonds, soccer fields, a lawn area, play apparatus, snack shack, and batting cages. Gateshead Park is a 0.12-acre park with shade trees, drinking fountains, and picnic tables. Port Royal Park is a 3.98-acre park with basketball courts, a bike path, a children's play area, a picnic area, restrooms, and soccer fields. No parks will be closed due to the construction of the levee project. See *Section V.L, Recreation* for additional information.

The proposed project includes raising an existing levee with a slight deviation from the existing levee system footprint and would not require additional water, wastewater, stormwater drainage, solid waste, fire protection, police protection, schools, or other public services beyond those currently provided. Existing power lines would not be impacted during construction and all parks would remain open. Because the project does not propose any new buildings or land uses, the project would not increase the demand for public services, including fire and police protection, schools, or parks, and would not require constructions and would not result in any significant impact.

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[1] City of Foster City, 2016d. Park Grid. Available at: http://www.fostercity.org/parksandrecreation/park-grid.cfm, accessed May 5.

B. GROWTH-INDUCING IMPACTS

A project is considered growth-inducing if it would directly or indirectly foster substantial economic or population growth or the construction of additional housing.

Examples of projects likely to have significant growth-inducing impacts include extensions or expansions of infrastructure systems beyond that which is needed to serve project-specific demand, and the development of new residential subdivisions or industrial parks in areas that are currently only sparsely developed or are undeveloped. Typically, redevelopment projects on infill sites that are surrounded by existing urban uses are not considered growth-inducing because redevelopment by itself usually does not facilitate development intensification on adjacent sites.

Implementation of the proposed project would not result in direct population growth because new housing units are not included. Additionally, no new major infrastructure (e.g., water, sewer, roads) extensions would be necessary to serve the project. Therefore, no indirect population growth would occur. Therefore, the project would not have any direct or indirect growth-inducing effects.

C. UNAVOIDABLE SIGNIFICANT ENVIRONMENTAL IMPACTS

Implementation of the proposed project would result in two significant unavoidable impacts that could not be avoided by implementation of mitigation measures, or reduced to a less-than-significant level:

- AES-1: The increased elevation of the levee would alter the existing visual character and may adversely impact scenic vistas of the San Francisco Bay from Shorebird Park (segment 4) under the two project scenarios (2050 Sea Level Rise and 2100 Sea Level Rise) and scenic vistas of the Belmont Hills from Sea Cloud Park (segment 6) under the 2100 Sea Level Rise project scenario.
- NOISE-1: Construction of the proposed project could result in the exposure of nearby sensitive receptors, such as residences, schools, hospitals, and retirement homes, to temporary noise levels that would conflict with the City of Foster City Municipal Code regulations, and could generate substantial increases in noise levels for intermittent periods when certain construction activities occur (e.g., pile driving).

D. SIGNIFICANT IRREVERSIBLE CHANGES

An EIR must identify any significant irreversible environmental changes that could result from implementation of a proposed project. These may include current or future uses of nonrenewable resources, and secondary impacts that commit future generations to similar uses. CEQA dictates that irretrievable commitments of resources should be evaluated to ensure that such current consumption is justified. The CEQA Guidelines describe three categories of significant irreversible changes: (1) changes in land use that would commit future generations; (2) irreversible changes from environmental actions; and (3) consumption of nonrenewable resources.

1. Changes in Land Use Which Would Commit Future Generations

The project would improve an existing levee system and would not alter the current land use designations. Therefore, the project would not result in changes in land use that would commit future generations to a poor use of resources.

2. Irreversible Changes from Environmental Actions

No significant irreversible environmental damage, such as what could occur as a result of an accidental spill or explosion of hazardous materials, is anticipated due to redevelopment activities associated with the project. Furthermore, compliance with federal, state, and local regulations and the implementation of mitigation measures identified in *Section V.G, Hazards and Hazardous Materials*, would reduce to a less-than-significant level the possibility that hazardous substances within the project site could cause significant environmental damage.

3. Consumption of Nonrenewable Resources

Consumption of nonrenewable resources includes conversion of agricultural lands, loss of access to mining reserves, and use of nonrenewable energy sources. The project site is located within an urbanized area of Foster City. No agricultural lands exist on the project site; therefore, none would be converted to non-agricultural uses. In addition, the site does not contain known mineral resources and does not serve as a mining reserve; thus, implementation of the project would not result in the loss of access to mining reserves.

Although nonrenewable resources such as fuel and electricity would be used during construction of the project, they are temporary and not necessary for the operation of the project. The main materials for the project would be renewable including sheet piles made from steel and/or vinyl, both of which are made from recycled material; and fill (dirt). The infrastructure that would be built as part of the proposed project is expected to be long-lasting and construction methods are expected to be modern and efficient. Therefore, the use of these materials would not be considered wasteful and would not result in a significant increase in the consumption of nonrenewable resources.

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