DRAFT ENVIRONMENTAL IMPACT REPORT
Volume 2

Potrero Power Station
Mixed-Use Development Project

SAN FRANCISCO PLANNING DEPARTMENT
CASE NO. 2017-011878ENV
STATE CLEARINGHOUSE NO. 2017112005

SAN FRANCISCO
PLANNING
DEPARTMENT

Draft EIR Publication Date:	OCTOBER 3, 2018
Draft EIR Public Hearing Date:	NOVEMBER 8, 2018
Draft EIR Public Comment Period:	OCTOBER 4, 2018 – NOVEMBER 19, 2018

Written comments should be sent to:
San Francisco Planning Department
Attention: Rachel Schuett, PPS EIR Coordinator
1650 Mission Street, Suite 400 | San Francisco, CA 94103
or by email to: CPC.PotreroPowerStation@sfgov.org

DRAFT ENVIRONMENTAL IMPACT REPORT
Volume 2

Potrero Power Station
Mixed-Use Development Project

SAN FRANCISCO PLANNING DEPARTMENT
CASE NO. 2017-011878ENV
STATE CLEARINGHOUSE NO. 2017112005

SAN FRANCISCO
PLANNING
DEPARTMENT

Draft EIR Publication Date:	OCTOBER 3, 2018
Draft EIR Public Hearing Date:	NOVEMBER 8, 2018
Draft EIR Public Comment Period:	OCTOBER 4, 2018 – NOVEMBER 19, 2018

Written comments should be sent to:
San Francisco Planning Department
Attention: Rachel Schuett, PPS EIR Coordinator
1650 Mission Street, Suite 400 | San Francisco, CA 94103
or by email to: CPC.PotreroPowerStation@sfgov.org

TABLE OF CONTENTS

Potrero Power Station Mixed-Use Development Project Draft EIR

Page

Volume 2

Appendices

Page

List of Figures

Page

List of Figures (continued)

Page

List of Figures (continued)

List of Tables

Page

List of Tables (continued)

Page

List of Tables (continued)

This page intentionally left blank

CHAPTER 4

Environmental Setting, Impacts, and Mitigation Measures (continued)

This page intentionally left blank

4.H Wind and Shadow

4.H.1 Introduction

Section 4.H, Wind and Shadow, discusses both wind and shadow impacts. Wind is discussed first, followed by the discussion of shadow that begins on p. 4.H-24. Supplemental supporting information on wind and shadow is contained in Appendix F of this EIR.

4.H.2 Wind

This wind subsection describes the project's impacts on ground-level wind speeds at various locations on and near the project site. This subsection is based on a pedestrian wind study prepared for the project.[1] The "Environmental Setting" discussion that follows includes a general description of the wind environment in San Francisco and existing wind conditions on the project site. The "Regulatory Framework" section discusses regulations related to wind impacts from proposed development projects. The "Impacts and Mitigation Measures" discussion describes the criteria for determining whether wind impacts are significant under CEQA, the wind impacts of the proposed project and cumulative development projects, and mitigation and improvement measures.

4.H.2.1 Environmental Setting

San Francisco's Existing Wind Environment

In San Francisco, average winds speeds are the highest in the summer and lowest in the winter. However, the strongest peak wind speeds occur in the winter and are generally associated with storm conditions. The highest average wind speeds occur in mid-afternoon and the lowest occur in the early morning. Based on over 40 years of recordkeeping, the highest mean hourly wind speeds (approximately 20 miles per hour [mph]) occur mid-afternoon in July, while the lowest mean hourly wind speeds (in the range of 6 to 9 mph) occur throughout the day in November.

Meteorological data collected at the old San Francisco Federal Building at 50 United Nations Plaza over a six-year period show that westerly[2] through northwesterly winds are the most frequent and strongest winds during all seasons.[3] Of the 16 primary wind directions, five occur most frequently: northwest, west-northwest, west, west-southwest, and southwest. At the Federal Building during the hours from 6 a.m. to 8 p.m., 70 percent of the winds blow from five adjacent directions of the 16 compass directions, as follows: northwest (10 percent), west-northwest (14 percent), west (35 percent), west-southwest (2 percent), and southwest (9 percent). Over 90 percent of all measured winds with speeds over 13 mph—the speed at which winds typically begin to bother pedestrians—blow from these five directions.

1 RWDI, *Potrero Power Station Mixed-Use Development Project, San Francisco, CA: Pedestrian Wind Study*, March 19, 2018. The wind study is included in Appendix F.
2 Wind directions are reported as directions from which the winds blow.
3 Arens, E. et al., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, Vol. 24, No. 4, pp. 297–303, 1989.

Wind Effects on People

The comfort of pedestrians varies under different conditions of sun exposure, temperature, clothing, and wind speed.[4] Winds up to about 4 mph have no noticeable effect on pedestrian comfort. With speeds from 4 to 8 mph, wind is felt on the face. Winds from 8 to 13 mph will disturb hair, cause clothing to flap, and extend a light flag mounted on a pole. Winds from 13 to 19 mph will raise loose paper, dust, and dry soil, and will disarrange hair. For winds from 19 to 26 mph, the force of the wind will be felt on the body. With 26 to 34 mph winds, umbrellas are used with difficulty, hair is blown straight, there is difficulty in walking steadily, and wind noise is unpleasant. Winds over 34 mph and gusts can blow people over.

Wind Effects from Buildings

Tall buildings and exposed structures can strongly affect the wind environment for pedestrians. A building that stands alone or is much taller than the surrounding buildings can intercept and redirect winds that might otherwise flow overhead and bring them down the vertical face of the building to ground level, where they create ground-level wind and turbulence. This effect is often noticed near the northwest and southwest corners of tall buildings, where prevailing winds from the northwest and west strike west-facing building façades and are redirected and accelerated around the northwest and southwest corners of the building. These redirected winds can be relatively strong and turbulent and may be, in some instances, incompatible with the intended uses of nearby ground-level pedestrian spaces. Moreover, structure designs that present tall flat surfaces square to strong winds can create ground-level winds that can be hazardous to pedestrians. Conversely, a building with a height that is similar to the heights of surrounding buildings typically would cause little or no additional ground-level wind acceleration and turbulence.

Thus, wind impacts are generally caused by large building masses extending substantially above their surroundings, and by buildings oriented so that a large wall catches a prevailing wind, particularly if such a wall includes little or no articulation. In general, new buildings less than approximately 80 feet in height are unlikely to result in substantial adverse effects on ground-level winds such that pedestrians would be uncomfortable or hazardous wind conditions would result. Such winds may occur under existing conditions, but shorter buildings typically do not cause substantial changes in ground-level winds.

Analysis of Pedestrian-Level Winds

Winds experienced at ground level by pedestrians have long been evaluated in CEQA documents in San Francisco, with wind tunnel testing conducted for proposed high-rise structures since the 1970s. Until the mid-1980s, the City did not employ quantifiable criteria in consideration of a project's wind impacts, although quantification of relative changes in pedestrian wind conditions was undertaken as part of CEQA review. In 1985, section 148 was added to the San Francisco Planning Code, codifying wind requirements and establishing wind speed criteria for the Downtown (C-3) Use

[4] Lawson, T.V., and A.D. Penwarden, "The Effects of Wind on People in the Vicinity of Buildings," *Proceedings of the Fourth International Conference on Wind Effects on Buildings and Structures, London, 1975*, Cambridge University Press, Cambridge, U.K., 605–622, 1976.

Districts.[5] Section 148 defines *equivalent wind speed* as "an hourly mean wind speed adjusted to incorporate the effect of gustiness or turbulence on pedestrians." Wind speeds discussed herein refer to this equivalent wind speed. Under section 148, a hazardous wind condition exists when the wind speed at a particular location exceeds 26 mph for a single hour of the year.[6] Section 148 also establishes pedestrian *comfort wind speed* criteria of 11 mph for no more than 10 percent of the time year round, between 7 a.m. and 6 p.m., in areas of substantial pedestrian use and 7 mph for no more than 10 percent of the time year round, between 7 a.m. and 6 p.m., in public seating areas.[7]

Following the adoption of planning code section 148, the planning department developed procedures for implementation of the requirements, including a wind tunnel testing protocol that remains in use today. Although the proposed project is not within an area of the city where wind speed criteria are enforced through the planning code, CEQA review relies upon the section 148 hazard criterion citywide to determine whether a project would result in a significant wind impact and implements the section 148 procedures citywide in order to achieve comparable wind tunnel test results citywide.

Wind Conditions at the Project Site and in the Vicinity

The project site and vicinity are generally windy. Under existing conditions, winds exceed the 26-mph wind hazard criterion at nine of 165 locations tested for pedestrian wind conditions in the wind tunnel,[8] for a total of 38 hours per year, and the average wind speed that is exceeded one hour per year is 28 mph. The nine locations where the existing wind hazard criterion is exceeded are at:

- the southwest corner of 22nd and Illinois streets, across Illinois Street from the project site and adjacent to the southerly building of the American Industrial Center (test point 150; two hours per year);
- the north side of 23rd Street adjacent to the southwest corner of Station A (test point 61; 1 hour);
- a location near the foot of 23rd Street (test point 119; 1 hour);

5 Other sections of the San Francisco Planning Code apply comparable standards in the Downtown Residential (DTR) Districts, the Folsom and Main Residential/Commercial Special Use District, the Van Ness Special Use District, and certain zoning districts in the South of Market (SoMa) neighborhood.

6 The wind hazard criterion of 26 mph is derived from a wind condition that would generate a 3-second gust of wind at 20 meters per second (45 mph), a commonly used guideline for wind safety. This wind speed, on an hourly basis, is 26 mph averaged for a full hour. However, because the Civic Center Federal Building wind data were collected at one-minute averages, the 26-mph one-hour average wind speed is converted to a corresponding one-minute average wind speed of 36 mph, which is then used to determine compliance with the 26-mph one-hour hazard criterion in the planning code. (Arens, E. et al., "Developing the San Francisco Wind Ordinance and its Guidelines for Compliance," *Building and Environment*, Vol. 24, No. 4, pp. 297–303, 1989.) All hazard wind speeds in this analysis are presented based on the 36-mph wind speed averaged over one-minute, and the hazard criterion is based on 36 mph.

7 The wind comfort criteria are defined in terms of *equivalent wind speed*, which is an average wind speed (mean velocity), adjusted to include the level of gustiness and turbulence. Equivalent wind speed is defined as the mean wind velocity, multiplied by the quantity (one plus three times the turbulence intensity) divided by 1.45. This calculation magnifies the reported wind speed when turbulence intensity is greater than 15 percent.

8 As described in more detail under "Methodology," wind test points were chosen to illustrate the general flow of winds around project buildings at select locations. An additional 19 points were located at mid-street locations on certain streets to evaluate wind effects on bicyclists, for informational purposes; see discussion on p. 4.H-22.

- a location north of the project site, within the approved Pier 70 Mixed-Use District project site, west of the north-south portion of 20th Street (test point 137; 3 hours);
- four onsite locations at and near the northeast corner of Station A (test points 9, 72, 76, and 77; 2, 8, 13, and 7 hours, respectively); and
- onsite in the paved, open yard east of Station A (test point 163; 1 hour).

Figure 4.H-1, Pedestrian Wind Hazards, Existing Conditions, depicts existing wind hazard conditions. Of the nine existing hazard criterion exceedances, only the first three above (test points 150, 61, and 119) are in locations that are publicly accessible. Existing wind speeds exceed the hazard criterion for an aggregate of four hours at these three locations. The great majority of the existing wind hazard exceedance duration (30 of 38 hours) occurs at the four closely spaced locations near the northeast corner of Station A, an area that is not currently publicly accessible.

Winds currently exceed the pedestrian comfort criterion at 140 of the 165 locations tested, including most onsite locations. The locations where the wind comfort criterion is not exceeded are typically in sheltered spots behind or adjacent to existing buildings that provide shelter from prevailing westerly and northwesterly winds, such as east of Station A and between Station A and other existing buildings. **Figure 4.H-2, Pedestrian Wind Comfort, Existing Conditions,** depicts existing wind comfort conditions.

4.H.2.2 Regulatory Framework

Local Regulations

San Francisco General Plan

Central Waterfront Plan

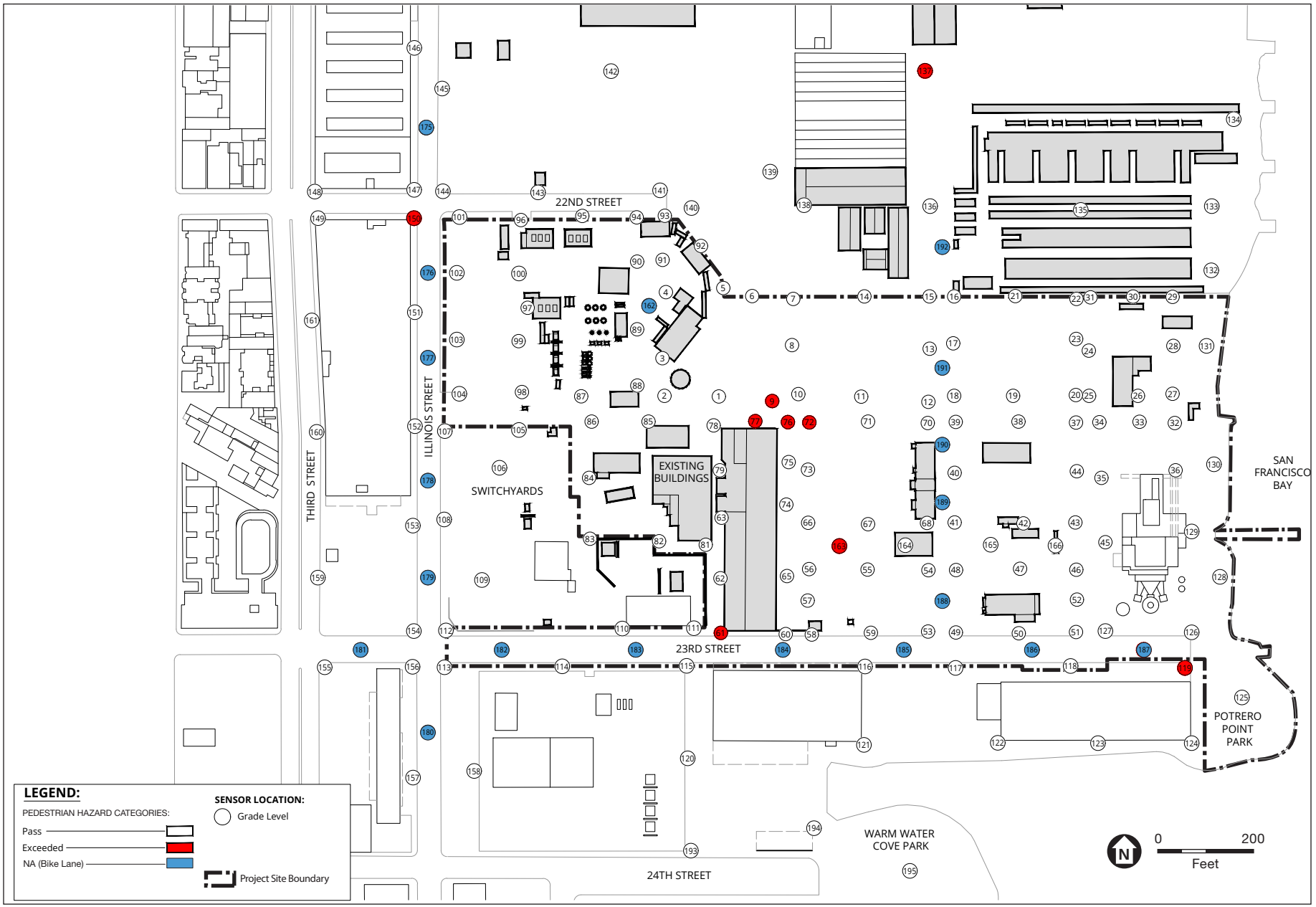
> ***Policy 5.2.6*:** Ensure quality open space is provided in flexible and creative ways, adding a well-used, well-cared for amenity for residents of a highly urbanized neighborhood. Private open space should meet the following design guidelines:
>
> A. Designed to allow for a diversity of uses, including elements for children, as appropriate.
>
> B. Maximize sunlight exposure and protection from wind
>
> C. Adhere to the performance-based evaluation tool.

4.H.2.3 Impacts and Mitigation Measures

Significance Criteria

The following significance criterion is from Appendix B of the San Francisco Planning Department's Environmental Review Guidelines (which is the planning department's Initial Study Checklist) and is used to determine the level of impact related to wind. Implementation of the proposed project would have a significant effect related to wind if the project would:

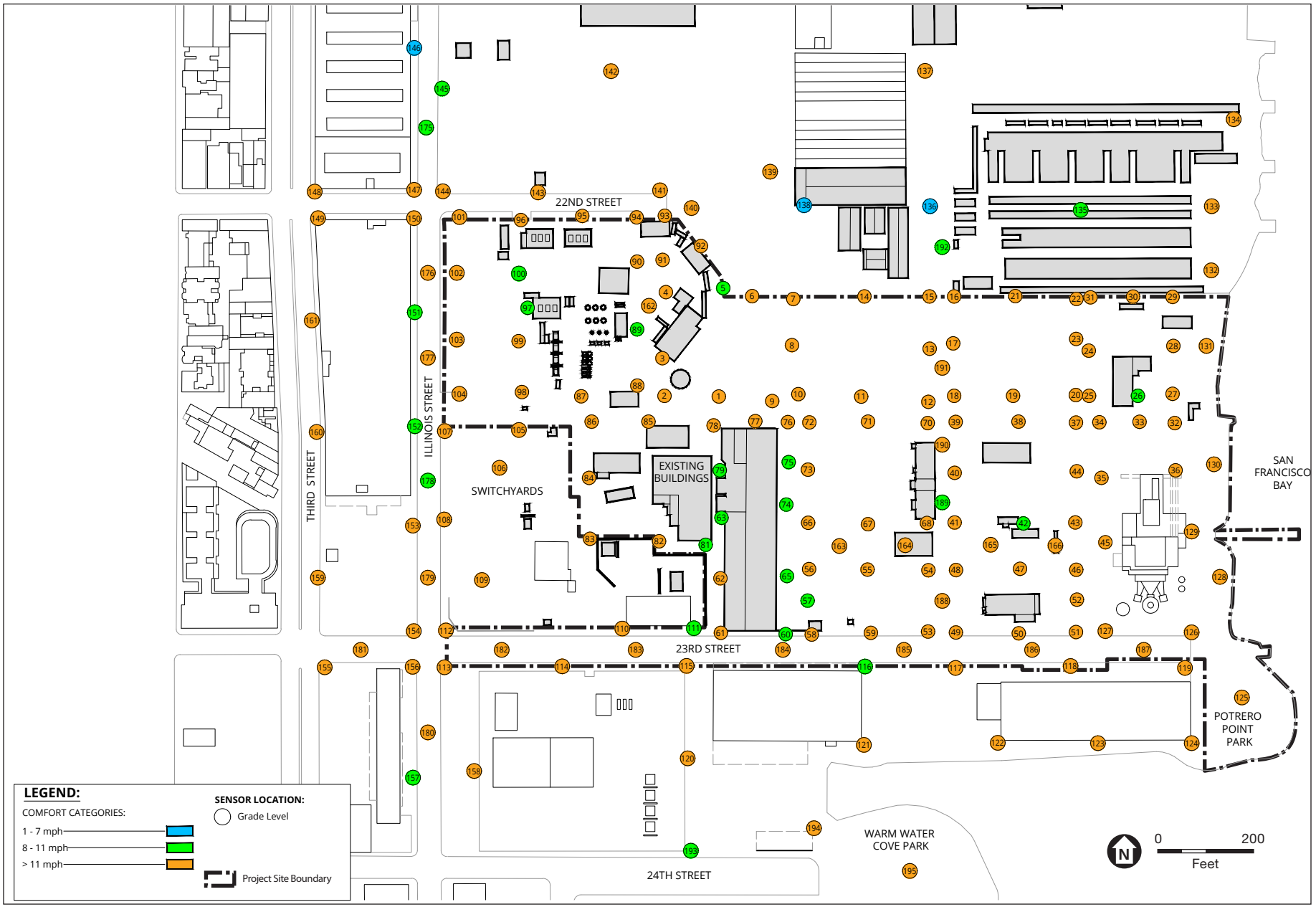
- Alter wind in a manner that substantially affects public areas.



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-1
Pedestrian Wind Hazards, Existing Conditions



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-2
Pedestrian Wind Comfort, Existing Conditions

For purposes of determining whether a project would "alter wind in a manner that substantially affects public areas," the planning department relies on the 26-mph wind hazard criterion of planning code section 148, described above in section 4.H.2.1 under "Analysis of Pedestrian-Level Wind."

Approach to Analysis

Project Features

Building Locations and Maximum Building Heights

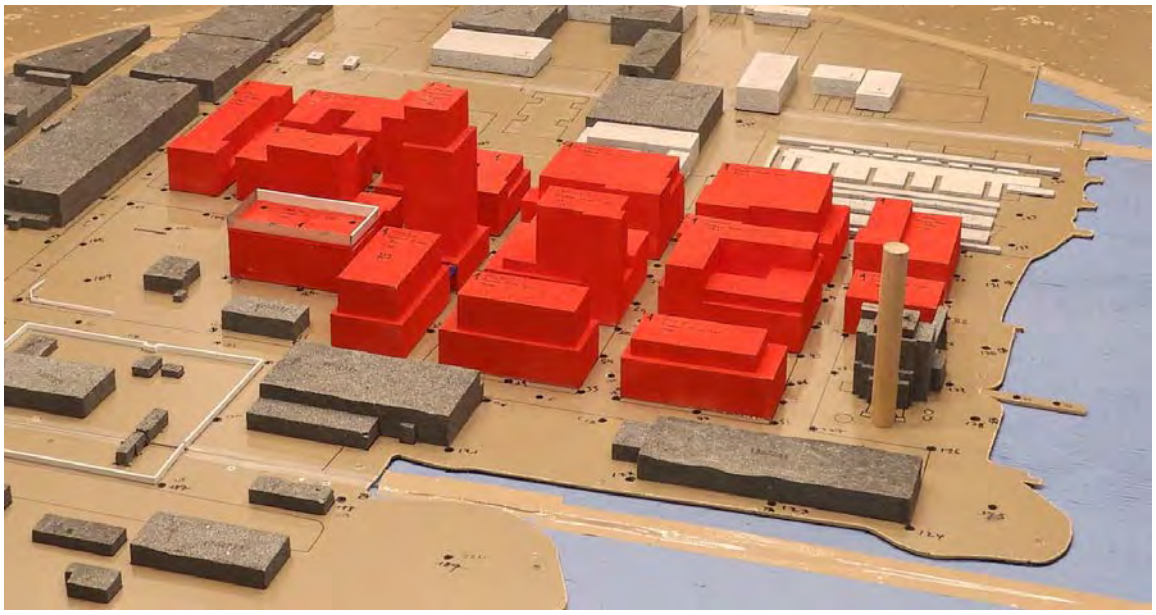
The proposed project would include amendments to the San Francisco General Plan and Planning Code, and create a new Potrero Power Station Special Use District (SUD). The existing Height and Bulk Districts on the 29-acre site are 40-X and 65-X (maximum building heights of 40 feet and 65 feet, respectively). The proposed project would increase the height limits to between 65 feet and 180 feet throughout the project site, and to 300 feet on Block 6, in the west-central portion of the site. As shown in Figure 2-7, in Chapter 2, Project Description, the proposed height limits would generally step up from east to west across the project site (i.e., increasing with greater distance from San Francisco Bay) and then step down again towards Illinois Street. The existing 300-foot-tall Boiler Stack would remain and would be accommodated by a corresponding height limit of 300 feet.[9] Several blocks would have height limits that would permit taller towers on a portion of the block, with the remainder of the block to be a shorter podium, generally at a height of 65 to 85 feet.

As described below under "Methodology," p. 4.H-10, wind tunnel testing involves development of a scale model to represent the proposed project. The wind tunnel model is based on the Proposed Height District Plan in Chapter 2, Figure 2-7, with towers and other building components above podium height, where applicable, that incorporate the upper-level setbacks and tower massing anticipated to be permitted under the proposed project. The Unit 3 Power Block is included in the wind tunnel model because it is a taller building than would be constructed at Block 9 if the power block is demolished, and thus retention of the power block results in a conservative analysis of project impacts. The model as tested is based on the "preferred project" described in Chapter 2, Project Description. However, the model would accommodate various project options described in Chapter 2, for the following reasons:

- the ultimate land use on the project's flex blocks would not be anticipated to alter the overall building massing;
- the retention of the Unit 3 Power Block in the model is conservative, as explained above;
- the utility options would not affect building massing; and
- the potential variation in the width of Humboldt Street would affect only the westernmost portion of the site where the project would develop new buildings only on the north side of the street and only to a height of 85 feet, which would not result in substantial wind impacts.

[9] If the Unit 3 power block is retained and rehabilitated as part of Block 9, it, too, would be accommodated with respect to the height limit of that structure.

While the location of the district parking garage, if different than in the preferred project, could result in minor alterations of building height, the height of the garage would not be anticipated to exceed 90 feet, and therefore would not meaningfully change wind impacts. **Figure 4.H-3**, **Wind Tunnel Model**, presents a photograph of the model used in the wind tunnel testing.



SOURCE: RWDI, 2018

Figure 4.H-3
Wind Tunnel Model

Proposed Open Space

The proposed project would construct approximately 6.2 acres of publicly accessible open space. Open spaces included as part of the proposed project are described below.

- ***Waterfront Park.*** An approximately 3.6-acre waterfront park would extend the Blue Greenway and Bay Trail through the project site, and provide spill-out spaces for retail, quiet spaces, and waterfront viewing terraces and recreational area. Additional amenities could include trellis structures, barbecues, a recreational dock, and public art.
- ***Louisiana Paseo.*** A 0.7-acre plaza-type open space adjacent to Blocks 6 and 10 could have gardens, trellis structures, and seating areas.
- ***Power Station Park.*** A 1.22-acre central green space would extend east-west through the interior of the project site and connect the Louisiana Paseo to the waterfront. This park could contain play structures, art, barbecues, and outdoor dining areas. The eastern portion of the park would contain lawn spaces that could accommodate soccer fields, while the western park would be intended for community activities and would include an outdoor game room.
- ***Rooftop Soccer Field.*** A publicly accessible open space is proposed on a portion of the roof of the parking structure on Block 5. This rooftop open space would include a 0.68-acre soccer field covered in artificial turf.

Project Features to Reduce Wind Impacts

The project as tested in the wind tunnel includes two features specifically designed to minimize potential pedestrian-level winds: a canopy between buildings on Blocks 6 and 10 and a porous wind screen surrounding the rooftop soccer field on a building on Block 5.

Methodology

The wind tunnel test was conducted using a 1:400 (1 inch = approximately 33 feet) scale model of the proposed project and surrounding buildings within an approximately 1,600-foot radius centered on the project site, which is sufficient to encompass buildings on the site as well as nearby buildings that could affect winds on and near the site. The circular study area extends west to Tennessee Street, north to 20th Street to encompass nearly the entirety of the Pier 70 Mixed-Use District project site, and south to approximately 25th Street. The test area also extends east into San Francisco Bay.

Using 16 compass directions (northwest, west-northwest, west, west-southwest, southwest, etc.) wind tunnel tests were conducted for the project site and vicinity using the following scenarios:

- Existing
- Existing plus Project
- Cumulative (with Project)

The existing scenario includes one recently completed project at 1201 Tennessee Street that was under construction when the wind tunnel testing was undertaken.[10] The cumulative scenario includes the approved Pier 70 Mixed-Use District project to the north. No other cumulative projects identified in EIR section 4.A (Table 4.A-1) were sufficiently close to the project site to have a meaningful effect on pedestrian-level winds.

The scale model, which was equipped with permanently mounted wind speed sensors, was placed inside an atmospheric boundary layer wind tunnel. The model had 189 wind speed sensors (also known as wind sensor test points) to measure mean and gust wind speeds at an equivalent full-scale height of approximately 5 feet above ground. Of these test points, 165 were evaluated against the pedestrian wind criteria and 19 others, at locations in the middle of streets, were separately evaluated, for informational purposes only, with respect to wind conditions for bicyclists.[11] Under existing conditions test point locations 64, 69, 80, 167, and 168, are covered by existing buildings that are planned for demolition. Therefore, those five test point locations were not tested in the existing scenario, resulting in 165 pedestrian test locations under existing conditions and 170 test locations under existing-plus-project and cumulative conditions. Wind effects on bicyclists are discussed separately, for informational purposes, on p. 4.H-23.

[10] The Pier 70 Historic Core project along 20th Street east of Illinois Street consists of rehabilitation of existing buildings and is also therefore included in the Existing scenario.

[11] Four additional test points (169-174) were located, for existing-plus-project and cumulative conditions only, on the rooftop soccer field on Block 5. However, those points are not included in the analysis and are discussed for informational purposes only.

Locations for wind speed sensors, or study test points, were selected to indicate how the general flow of winds would be directed around the project buildings. Consistent with planning code section 148, the locations of test points would primarily be publicly accessible sidewalks and open spaces under with-project conditions, which are assumed to be areas of substantial pedestrian use.[12] Although pedestrian traffic on most sidewalks in the project vicinity is currently light, with development of the proposed project, sidewalks within and surrounding the project site would experience substantially more pedestrian traffic. There are no existing public seating areas in the project vicinity. Such facilities are typically within parks, privately-owned publicly accessible open spaces, or other similar publicly accessible spaces or street furniture (e.g., benches), none of which exist in the project vicinity.

Pedestrian-level wind conditions are affected by the interaction of wind flows among multiple structures. Accordingly, winds at the base of a building may change once a nearby building is completed. Therefore, this analysis not only considers full-buildout conditions but also includes a qualitative discussion of interim conditions—when only a portion of the project is built—during the 15-year construction period.

Impact Evaluation

Impact WS-1: Full build out of the proposed project would not alter wind in a manner that substantially affects public areas on or near the project site. (*Less than Significant)*

Wind Hazard Analysis

Buildout under the project would alter wind patterns on and near the project site. The proposed project would substantially change building height and massing at the project site by developing a new urban neighborhood with more than a dozen buildings at heights of 65 feet to 180 feet throughout the project site, along with one 300-foot-tall tower on Block 6. Under existing conditions, winds exceed the hazard criterion at nine of 165 pedestrian test points, for a total of 38 hours per year. Under the existing-plus-project conditions, seven of the nine existing wind hazard criterion exceedance locations would be eliminated and there would be four new exceedance locations, for a total of six exceedance locations among 170 pedestrian test points.[13] The wind hazard criterion would be exceeded for an aggregate 28 hours per year. This would represent a net decrease of three pedestrian hazard exceedance locations and 10 hours per year. **Table 4.H-1**, **Exceedances of Wind Hazard Criterion**, presents the results of the wind tunnel test for those points for which the pedestrian wind hazard criterion is exceeded under one or more scenarios.

12 To study the effects of wind on pedestrians, sensors are located approximately 5 feet off of the ground.

13 As noted in the Setting, five ground-level test points under with-project conditions are covered by existing buildings; hence, there are five additional at-grade test points with project implementation. The 170 pedestrian test points does not include four points on the proposed rooftop soccer field on Block 5 or 19 mid-street (bicycle) locations, as these are not considered pedestrian locations. The soccer field and bicycle wind conditions are discussed separately for informational purposes, below.

TABLE 4.H-1
EXCEEDANCES OF PEDESTRIAN WIND HAZARD CRITERION (WIND HAZARD CRITERION = 36 MPH)[1]

Test Point	Existing			Existing plus Project				Cumulative (including Project)					Open Space[2]
	Wind Speed Exceeded 1 hr./yr. (mph)	Hrs./Yr. Wind Speed >Haz. Crit.	Exceeds Haz. Crit.?	Wind Speed Exceeded 1 hr./yr. (mph)	Hrs./Yr. Wind Speed >Haz. Crit.	Hours Change Rel. to Existing	Exceeds Haz. Crit.?	Wind Speed Exceeded 1 hr./yr. (mph)	Hrs./Yr. Wind Speed >Haz. Crit.	Hours Change Rel. to Existing	Exceeds Haz. Crit.?	Hours Change Rel. to Project	
2	27	0		**42**	**18**	**18**	**Y**	**41**	**12**	**12**	**Y**	**-6**	
9	**37**	**2**	**Y**	29	0	-2		33	0	-2		0	
17	30	0		**38**	**2**	**2**	**Y**	24	0	0		-2	
61	**36**	**1**	**Y**	**38**	**2**	**1**	**Y**	**37**	**1**	**0**	**Y**	**-1**	
72	**40**	**8**	**Y**	24	0	-8		24	0	-8		0	
76	**41**	**13**	**Y**	**36**	**1**	**-12**	**Y**	**36**	**1**	**-12**	**Y**	**0**	LP
77	**38**	**7**	**Y**	31	0	-7		31	0	-7		0	
83	28	0		**39**	**4**	**4**	**Y**	**39**	**5**	**5**	**Y**	**1**	
119	**36**	**1**	**Y**	25	0	-1		26	0	-1		0	
137	**39**	**3**	**Y**	28	0	-3		23	0	-3		0	
140	31	0		**36**	**1**	**1**	**Y**	26	0	0		-1	
150	**37**	**2**	**Y**	28	0	-2		28	0	-2		0	
163	**36**	**1**	**Y**	20	0	-1		20	0	-1		0	PSP
		Total Hours	Total		Total Hours	Hours Chg. fr. Existing	Total		Total Hours	Hours Chg. fr. Existing	Total	Hours Chg. fr. Project	
		38	9		28	-10	6		19	-19	4	-9	

NOTES:

1 This table presents data for test points for which the pedestrian wind hazard criterion is exceeded in one or more scenarios. Refer to Appendix F for complete results of wind tunnel testing.

2 Open Spaces: LP – Louisiana Paseo; PSP – Power Station Park

Bold-face indicates exceedance of hazard criterion; Green shading indicates proposed onsite open space.

SOURCE: RWDI

Under existing-plus-project conditions, the seven existing exceedances of the wind hazard criterion that would be eliminated are as follows:

- the southwest corner of 22nd and Illinois streets (test point 150);
- a location near the foot of 23rd Street, adjacent to Potrero Point Park (test point 119);
- the location north of the site, within the Pier 70 project site (test point 137);
- three of the four onsite locations at and near the northeast corner of Station A, which would be demolished (test points 9, 72, and 77); and
- onsite within what would be the Power Station Park open space (test point 163).

At test point 61, on the north side of 23rd Street, an existing wind hazard exceedance would increase in duration from 1 hour per year to 2 hours per year, while at test point 76, an existing wind hazard exceedance would decrease in duration from 13 hours per year to 1 hour per year.

Buildout of the proposed project would also create four new exceedances of the wind hazard criterion at the following locations:

- on 22nd Street between Georgia and Louisiana streets, just north of the project site and within the approved Pier 70 Mixed-Use District project site (test point 140; 1 hour per year);[14]
- onsite at the southwest corner of Block 1, adjacent to a proposed 180-foot-tall building (test point 2; 18 hours);
- onsite at the southwest corner of Block 5, adjacent to a proposed 90-foot-tall podium with a 180-foot-tall tower on the north side of this block (test point 83; 4 hours); and
- onsite on the east side of Maryland Street between the Humboldt Street Plaza and the northern property line, between two proposed buildings 125 feet in height (test point 17; 2 hours).

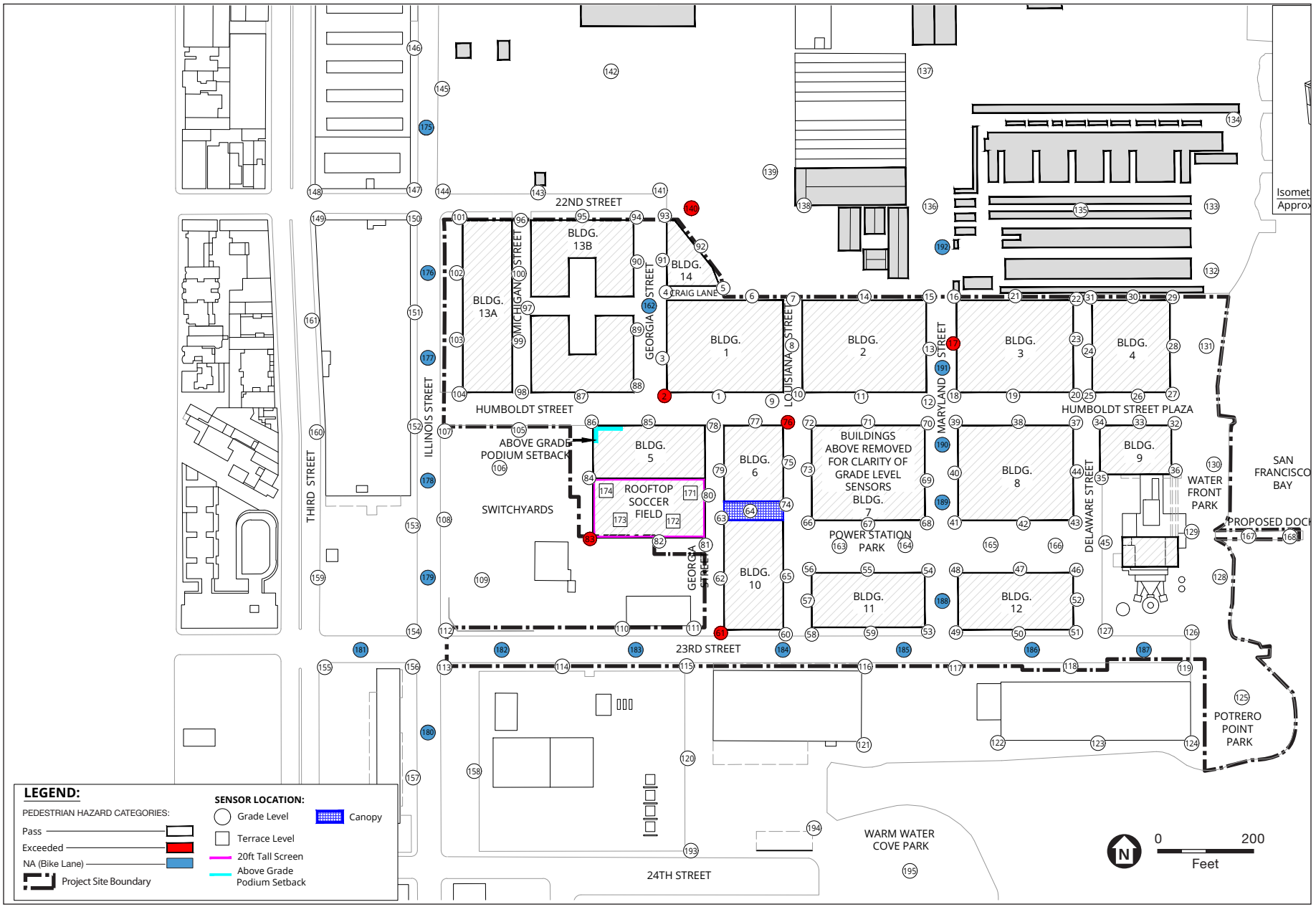
Figure 4.H-4, **Pedestrian Wind Hazards**, **Existing-plus-Project Conditions**, depicts wind hazard conditions under existing-plus-project conditions.

As would be expected with the physical development of relatively large buildings on a site with large vacant areas at present, the project would result in substantial changes in wind speeds at a number of test points. Overall, however, the proposed project would not alter wind in a manner that substantially affects public areas on and near the project site because (1) the number of test points at which the wind hazard criterion would be exceeded would decrease from nine under existing conditions to six under existing-plus-project conditions; (2) the proposed project would result in a 13-hour net reduction in the total number of hours that the wind hazard criterion is exceeded, from 38 hours per year to 28 hours per year; and (3) the average wind speed exceeded one hour per year under existing-plus-project conditions at all test points would be lower than under existing conditions (25 mph vs. 28 mph).

Additionally, the only exceedance of the wind hazard criterion in or adjacent to a proposed onsite open space would be at the northwest corner of the Louisiana Paseo (test point 76), where an existing exceedance of the wind hazard criterion would be reduced in duration from 13 hours per year under existing conditions to 1 hour per year under existing-plus-project conditions. At this location, the wind hazard speed exceeded 1 hour per year would be reduced from 41 mph to 36 mph. Therefore, buildout of the proposed project would result in ***less-than-significant*** wind impacts.

Mitigation: None required.

[14] This point is at the northwest corner of Pier 70's Parcel F, which under that project would be developed with a 90-foot-tall building.



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-4
Pedestrian Wind Hazards, Existing-plus-Project Conditions

There would be two locations under existing-plus-project conditions at which the wind hazard criterion would be exceeded for more than 2 hours per year: test point 2 (18 hours), at the southwest corner of Block 1 (northeast corner of the intersection of Georgia and Humboldt streets); and test point 83 (4 hours), at the southwest corner of Block 5 (near the project boundary and adjacent to an existing PG&E switchyard). Of these two locations, test point 2 would be expected to experience considerably more pedestrian activity, as it would be at a sidewalk location. **Improvement Measure I-WS-1, Wind Reduction Features for Block 1**, would improve wind conditions at this location. Despite the wind conditions at these locations, the project impact would be less than significant, as explained above, because the overall number of wind hazard exceedance locations, the number of hours of wind hazard exceedance, and the average wind speed exceeded one hour per year would all decrease, compared to existing conditions.

Improvement Measure I-WS-1: Wind Reduction Features for Block 1

As part of the schematic design of building(s) on Block 1, the project sponsor and the Block 1 architect(s) should consult with a qualified wind consultant regarding design treatments to minimize pedestrian-level winds created by development on Block 1, with a focus on the southwest corner of the block. Design treatments could include, but need not be limited to, inclusion of podium setbacks, terraces, architectural canopies or screens, vertical or horizontal fins, chamfered corners, and other articulations to the building façade. If such building design measures are found not to be effective, landscaping (trees and shrubs), street furniture, and ground-level fences or screens may be considered. If recommended by the qualified wind consultant, the project sponsor should subject the building(s) proposed for this block to wind tunnel testing prior to the completion of schematic design. The goal of this measure is to improve pedestrian wind conditions resulting from the development of Block 1. The project sponsor should incorporate into the design of the Block 1 building(s) any wind reduction features recommended by the qualified wind consultant.

Impact WS-2: The phased construction of the proposed project could alter wind in a manner that substantially affects public areas on or near the project site. (*Significant and Unavoidable with Mitigation*)

Construction of the proposed project is expected to occur in one start-up plus six overlapping phases over a period of approximately 15 years. As described above in Impact WS-1, at full buildout the proposed project would generally improve wind conditions, compared to existing conditions, and the project's effect on wind would be less than significant. However, during the rather lengthy construction period, a particular building configuration resulting from development of one or more individual structures could result in localized wind conditions that would be different than those reported for the project at full buildout. It is possible that such individual building(s) could cause the wind hazard criterion to be exceeded, perhaps for one or more years. However, once surrounding buildings have been completed, and they provide effective wind shelter as reported in the project wind tunnel test, these temporary impacts would cease. Depending upon the circumstances and the actual phasing of the construction, these temporary impacts could continue at various locations until the full buildout is completed. Therefore, this EIR conservatively considers such an occurrence to be a significant, if temporary, wind impact. Furthermore, if the proposed project were not to be

completed in the time period anticipated, a partial buildout situation could occur for an extended period, resulting in different wind characteristics than those tested in the wind tunnel. This, too, could result in one or more new exceedances of the wind hazard criterion and thus a significant wind impact.

The wind tunnel analysis conducted for the proposed project does not provide test results for such interim wind conditions and, as a practical matter, cannot provide such information, due to the number of possible permutations of development and building designs. Based on the wind tunnel analysis and knowledge of the prevailing wind directions, development of buildings on the project site generally from the west to the east would provide the best protection from potential wind hazards because it would result in early-phase sheltering of locations farther downwind. However, given that the proposed construction phasing would be in the opposite direction—from east to west—significant wind effects could arise prior to full project buildout. Depending on circumstances, such as the heights and proximity of surrounding buildings, buildings less than 85 feet in height would be less likely to create wind hazards.

To minimize the potential for individual building(s) to result in localized wind hazard exceedances, design measures and landscape features, such as podium setbacks, terraces, architectural canopies or screens, vertical or horizontal fins, chamfered corners, and other articulations to the building façade, as well as ground-level fences or screens, shrubs and trees, and/or street furniture could offer protection from hazardous winds.

Implementation of **Mitigation Measure M-WS-2: Identification and Mitigation of Interim Hazardous Wind Impacts**, shown below, would reduce the project's potentially significant wind impacts. However, because it cannot be stated with certainty that no such localized wind hazard exceedances would arise during the project construction period or that feasible interim wind-reduction measures would be available, this impact is considered ***significant and unavoidable with mitigation***.

> **Mitigation Measure M-WS-2: Identification and Mitigation of Interim Hazardous Wind Impacts**
>
> Prior to the approval of building plans for construction of any proposed building, or a building within a group of buildings to be constructed simultaneously, at a height of 85 feet or greater, the project sponsor (including any subsequent developer) shall submit to the San Francisco Planning Department for review and approval a wind impact analysis of the proposed building(s). The wind impact analysis shall be conducted by a qualified wind consultant. The wind impact analysis shall consist of a qualitative analysis of whether the building(s) under review could result in winds throughout the wind test area (as identified in the EIR) exceeding the 26-mph wind hazard criterion for more hours or at more locations than identified for full project buildout in the EIR. That is, the evaluation shall determine whether partial buildout conditions would worsen wind hazard conditions for the project as a whole. The analysis shall compare the exposure, massing, and orientation of the proposed building(s) to the same building(s) in the representative massing models for the proposed project and shall include any then-existing buildings and those under construction. The wind consultant shall review the proposed building(s) design taking into account feasible wind reduction features including, but not necessarily

limited to, inclusion of podium setbacks, terraces, architectural canopies or screens, vertical or horizontal fins, chamfered corners, and other articulations to the building façade. If such building design measures are found not to be effective, landscaping (trees and shrubs), street furniture, and ground-level fences or screens may be considered. Comparable temporary wind reduction features (i.e., those that would be erected on a vacant site and removed when the site is developed) may be considered. The project sponsor shall incorporate into the design of the building(s) any wind reduction features recommended by the qualified wind consultant.

If the wind consultant is unable to determine that the building(s) under consideration would not result in a net increase in hazardous wind hours or locations under partial buildout conditions compared to full buildout conditions, the building(s) under review shall undergo wind tunnel testing. The wind tunnel testing shall evaluate the building(s) to determine whether an adverse impact would occur. An adverse wind impact is defined as an aggregate net increase of 1 hour during which, and/or a net increase of 2 locations at which, the wind hazard criterion is exceeded, compared to full buildout conditions identified in the EIR and based on the existing conditions at the time of the subsequent wind tunnel test. As used herein, the existing conditions at the time of the subsequent testing shall include any completed or under construction buildings on the project site. As with the qualitative review above, the evaluation shall determine whether partial buildout conditions would worsen wind hazard conditions for the project as a whole. Accordingly, wind tunnel testing, if required, would include the same test area and test points as were evaluated in the EIR.

If the building(s) would result in an adverse impact, as defined herein, additional wind tunnel testing of mitigation strategies would be undertaken until no adverse effect is identified, and the resulting mitigation strategies shall be incorporated into the design of the proposed building(s) and building site(s). All feasible means as determined by the Environmental Review Officer (such as reorienting certain buildings, sculpting buildings to include podiums and terraces or other wind reduction treatments noted above or identified by the qualified wind consultant, or installing landscaping) to eliminate hazardous winds, if predicted, shall be implemented.

Significance after Mitigation: Significant and Unavoidable. Since it cannot be stated with certainty that no such localized wind hazard exceedances would arise during the project construction period or that feasible interim wind-reduction measures would be available or effective, the impact could be significant during the interim period prior to full buildout, even with mitigation. Therefore, this impact would be considered ***significant and unavoidable with mitigation***.

Cumulative Impacts

As noted above, the cumulative scenario includes the approved Pier 70 Mixed-Use District project to the north. No other cumulative projects identified in EIR section 4.A (Table 4.A-1) were sufficiently close to the project site to have a meaningful effect on pedestrian-level winds.

Impact C-WS-1: The proposed project at full buildout, when combined with other cumulative projects, would not alter wind in a manner that substantially affects public areas. (*Less than Significant*)

Wind Hazard Analysis

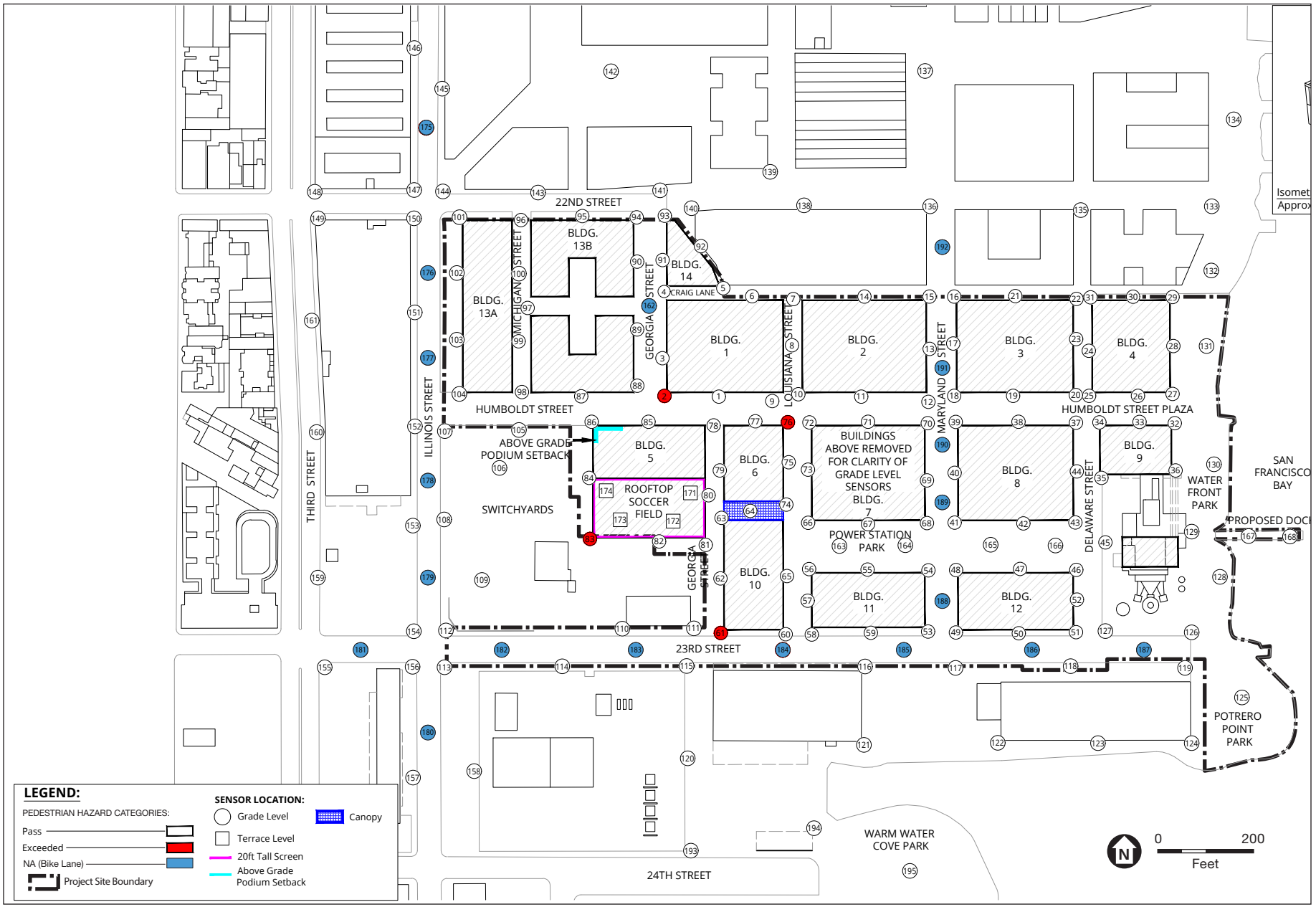
With the introduction of cumulative development (i.e., the Pier 70 Mixed-Use District project), wind hazard conditions would change very little, compared to conditions with the proposed project alone. The number of exceedances of the Planning Code hazard criterion would decrease to four, from six under existing-plus-project conditions. The number of hours during which the hazard criterion would be exceeded would decline from an aggregate of 28 hours per year to 19 hours per year. The average wind speed exceeded one hour per year would decline slightly from conditions with the project alone, from 25 mph to 23 mph. Two hazard criterion exceedances, both in the north-central portion of the project site (test points 17 and 140), would be eliminated with cumulative development, compared to with-project conditions, as buildings developed on the Pier 70 site would provide additional shelter from prevailing winds. The wind speed exceeded one hour per year would decline at these two points by 14 mph and 10 mph, respectively, from with-project conditions.

Four existing-plus-project scenario hazard exceedances (test points 2, 61, 76, and 83) would continue to exceed the wind hazard criterion under cumulative conditions (two of these exceedances are also present under existing conditions), generally for a similar duration except at test point 2, where the number of hours during which the wind hazard criterion would be exceeded would decline from 18 hours per year under existing-plus-project conditions to 12 hours per year under Cumulative conditions. **Figure 4.H-5**, **Pedestrian Wind Hazards**, **Cumulative Conditions**, depicts cumulative wind hazard conditions.

Because cumulative wind conditions would incrementally improve with the introduction of cumulative development, there would not be a significant impact. Therefore, the proposed project's cumulative wind impact would be ***less than significant***.

Mitigation: None required.

In summary, the proposed project would not alter wind in a manner that substantially affects public areas near the project site because the project would result in a reduction in the number of test points at which the wind hazard criterion would be exceeded, a net reduction in the total number of hours that exceed the wind hazard criterion, and a reduction in the average wind speed exceeded one hour per year. The only wind hazard exceedance location in or adjacent to a proposed onsite open space, at the northwest corner of the Louisiana Paseo, would be substantially reduced in duration and in wind hazard with the project, compared to existing conditions. Therefore, buildout of the proposed project would result in ***less-than-significant*** wind impacts.



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-5
Pedestrian Wind Hazards, Cumulative Conditions

Supplemental Information

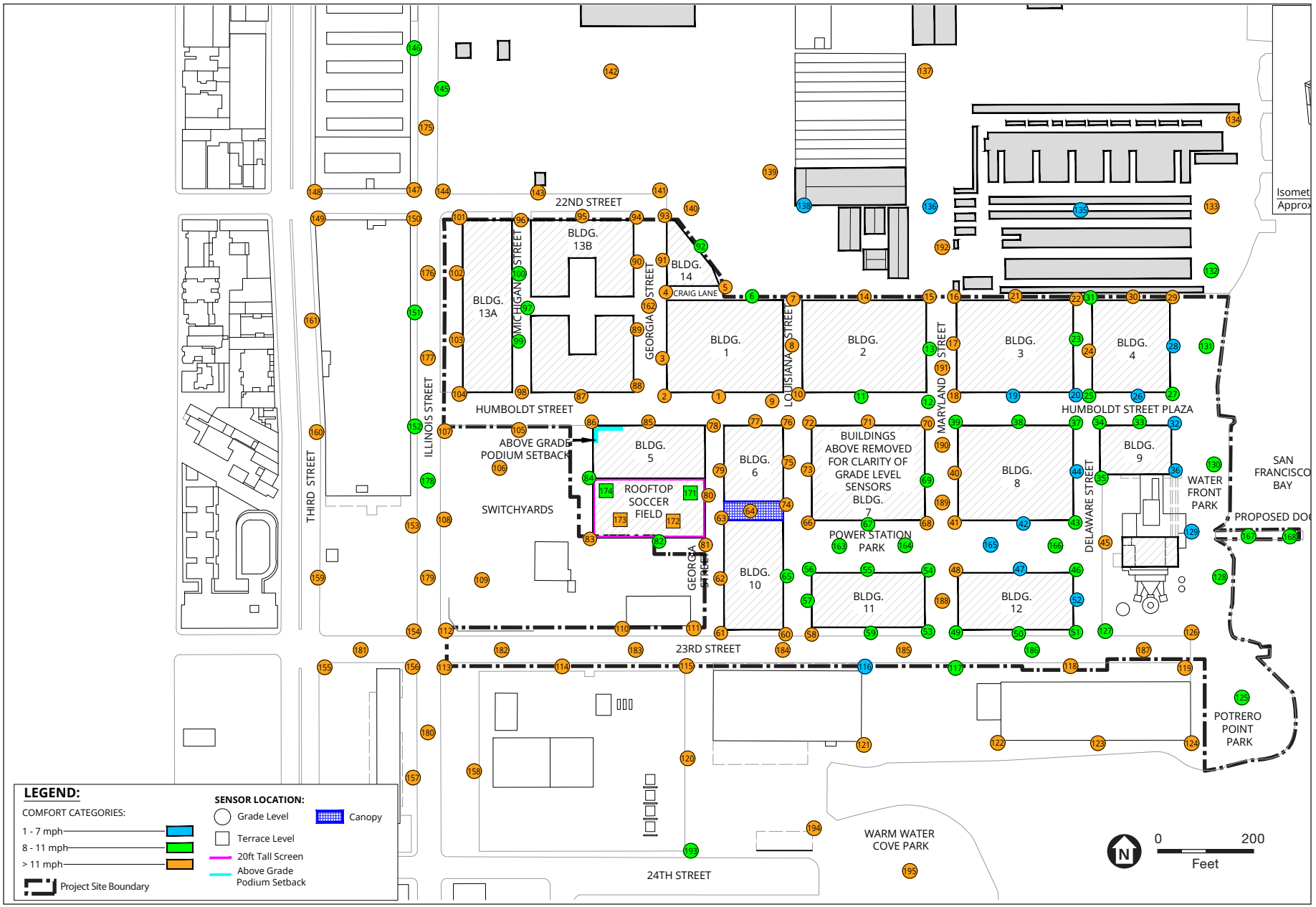
Wind Comfort

The wind comfort analysis is a measure of overall wind conditions, included in this EIR for informational purposes. The 11-mph wind comfort criterion is not a CEQA criterion of significance, so this discussion is not part of the impact analysis. The wind comfort criterion is useful in describing the overall wind environment because the comfort criterion wind speeds (those exceeded 10 percent of the time) are more representative of "typical" windy conditions than are the hazard criterion wind speeds, which are those exceeded only one hour per year, or approximately one one-hundredth of a percent of the time.

With project implementation, the wind comfort speeds would generally decrease across the eastern two-thirds of the project site and surrounding area, including along 23rd Street, adjacent to the site, because new project buildings would provide shelter from prevailing westerly and northwesterly winds. This is consistent with the general rule that a more densely built environment has lower pedestrian wind speeds than locations with scattered buildings that provide less wind shelter, particularly scattered tall buildings that may also accelerate ground-level winds. Conversely, the wind comfort speeds would increase at most locations in the western third of the project site, particularly near the bases of buildings along Georgia Street and along 23rd Street at the project site's southwestern corner, as well as at the western edge of Block 5. This would also be consistent with typical wind conditions resulting from new development, which often result in increased pedestrian-level wind speeds at and near the northwest and southwest corners of buildings that are substantially taller than upwind development.

Currently, wind speeds exceed the 11-mph pedestrian comfort criterion at 140 of the 165 pedestrian locations tested, including most onsite locations. Under existing-plus-project conditions, wind speeds would exceed the pedestrian comfort criterion at 103 of 170 pedestrian test point locations. Locations where the pedestrian comfort criterion would no longer be exceeded would typically be shielded from prevailing westerly and northwesterly winds by project buildings. These locations would include much of the onsite open space, including most of Waterfront Park, Power Station Park, and the southerly portion of the Louisiana Paseo, and along 23rd Street. **Figure 4.H-6**, **Pedestrian Wind Comfort**, **Existing-plus-Project Conditions**, depicts wind comfort conditions under existing-plus-project conditions.

Of the 103 exceedances of the 11-mph pedestrian comfort criterion under existing-plus project conditions, 14 would be new, compared to existing conditions, while 49 existing exceedances of the pedestrian comfort criterion would be eliminated under with-project conditions. Most of the new comfort speed exceedances would be at locations that are currently sheltered from prevailing winds behind existing structures that would be demolished. However, several new exceedances would be concentrated around the base of Block 6, where the project's tallest new structure, at 300 feet in height, would be built; wind speeds at some the of these points, between Block 6 and the 180-foot-tall building on Block 5, would also be influenced by the Block 5 structure. Existing wind comfort exceedances that would be eliminated would be concentrated in the eastern portion of the project site and would include many currently unsheltered locations within areas proposed as open space under



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-6
Pedestrian Wind Comfort, Existing-plus-Project Conditions

the proposed project. Of the 165 common test points in the existing and existing-plus project scenarios, wind comfort speeds would decrease at 103 and increase at 43, while wind speeds would remain unchanged at 19 points.

Proposed Onsite Open Spaces, Project Effects

Wind comfort speed conditions are discussed here for each of the four proposed onsite open spaces.

Waterfront Park. The only nearby sizable structures upwind of the Bayfront area that would become Waterfront Park are the slender Boiler Stack and the Unit 3 Power Block, the tallest part of which consists of a structural steel frame, with attached concrete elevator tower, that has less effect on pedestrian winds than would a solid structure of comparable size. With project implementation, wind speeds would exceed the pedestrian comfort criterion at five of the 19 test points in the park area.

While it is unknown precisely where in the proposed Waterfront Park there may be seating facilities, five points in the Waterfront Park area would meet the 7-mph seating comfort criterion with project implementation, while 14 would not.

Louisiana Paseo. With project implementation, wind speeds would exceed the pedestrian comfort criterion at eight of 11 test points within or adjacent to the Louisiana Paseo. Wind speeds would also exceed the seating comfort criterion at all 11 test points.

Power Station Park. With project implementation, wind speeds would exceed the pedestrian comfort criterion at three of 14 test points within the park. Wind speeds would exceed the seating comfort criterion at 11 of the 14 points.

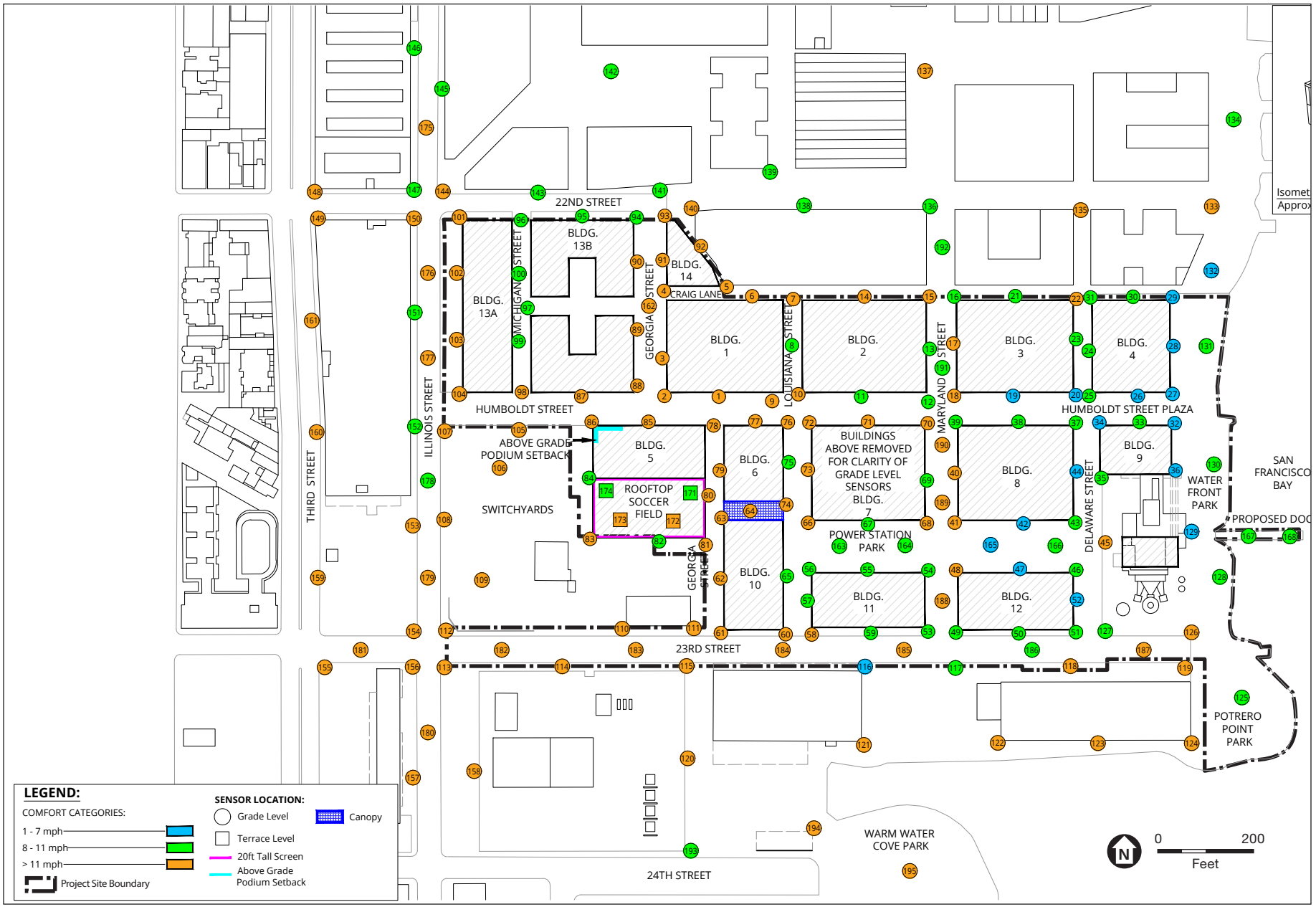
Rooftop Soccer Field. Under existing-plus project conditions, wind speeds would exceed the pedestrian comfort speed at one of four test points.

Cumulative Conditions

Cumulative wind comfort conditions would improve incrementally, compared to existing conditions and conditions with the proposed project, particularly in the northern portion of the project site and at test points within the Pier 70 Mixed-Use District project site. The number of locations at which wind speeds would exceed the pedestrian comfort criterion would decrease from 140 of 165 pedestrian test points under existing conditions to 103 of 170 points under with-project conditions and 90 of 170 points under cumulative conditions. Compared to the existing-plus-project conditions, under cumulative conditions there would be three new exceedances of the pedestrian comfort criterion, while 16 comfort exceedances would be eliminated. **Figure 4.H-7**, **Pedestrian Wind Comfort, Cumulative Conditions**, depicts cumulative wind comfort conditions.

Proposed Onsite Open Spaces, Cumulative Effects

Waterfront Park. Under cumulative conditions, wind speeds would exceed the pedestrian comfort criterion at three of the 19 test points in the park, compared to five exceedances under with-project conditions. Wind speeds would exceed the seating comfort criterion at 11 of the 19 points, compared to 14 exceedances under with-project conditions.



SOURCE: RWDI

Potrero Power Station Mixed-Use Development Project

Figure 4.H-7
Pedestrian Wind Comfort, Cumulative Conditions

Louisiana Paseo. Under cumulative conditions, wind speeds would exceed the pedestrian comfort criterion at seven of 11 test points within or adjacent to this open space, compared to eight exceedances under with-project conditions. Wind speeds would exceed the seating comfort criterion at all 11 test points, the same as under with-project conditions.

Power Station Park. Under cumulative conditions, wind speeds would exceed the pedestrian comfort criterion at three of 14 test points within the park, the same as under with-project conditions. Wind speeds would exceed the seating comfort criterion at 11 of the 14 points, also the same as under with-project conditions.

Rooftop Soccer Field. Under cumulative conditions, wind speeds would exceed the pedestrian comfort speed at two of four test points, compared to one exceedance under with-project conditions.

Wind Effects on Bicyclists

As indicated above, in addition to the pedestrian wind test points, 19 points were tested to gain some understanding of how winds could affect bicyclists. These points were located in the middle of certain streets, and thus would be closer to typical bicycle lanes (where present) than sidewalk test points, because typical bicycle lanes are separated from sidewalks by a parking lane. The points were located in Illinois Street (an existing bicycle route, with Class II bike lanes on either side of the street); 23rd Street (proposed with Class II bicycle lanes adjacent to the project site); and Maryland Street (proposed for a dedicated Class II bicycle lane on the project site, continuing north into the Pier 70 Mixed-Use Project site). One additional mid-street point was located on Georgia Street. Wind speeds exceeded one hour per year at mid-street (bicycle) test points are shown in **Table 4.H-2**.

As shown in Table 4.H-2, existing wind speeds exceeded one hour per year at the 19 mid-street test points range from a low of 19 mph to a high of 38 mph, at test point 187. Test point 187 is near the eastern end of 23rd Street, just west of San Francisco Bay and just south of the Boiler Stack on the project site. Because of its location, which is nominally closed to traffic other than that traveling to and from the existing DHL shipping facility on 23rd Street[15] and from which access to the bay is prevented by a cyclone fence, this location is likely minimally used by cyclists under existing conditions. With project implementation, wind speeds exceeded one hour per year at the 19 mid-street test points would range from 20 mph to 35 mph, with the highest speeds at test point 184, in 23rd Street adjacent to Louisiana Paseo, and at test point 162, in Georgia Street. As noted, 23rd Street is proposed to have bicycle lanes at test point 184, while the affected portion of Georgia Street would be a shared auto-bicycle street. Under cumulative conditions, wind speeds exceeded one hour per year at the 19 mid-street test points would range from 21 to 37 mph, with the highest speeds at test point 175, in Illinois Street north of the project site, and at test point 184, in 23rd Street at Louisiana Paseo. As noted, Illinois Street has existing bicycle lanes, and 23rd Street is proposed to have bicycle lanes.

[15] Although signage indicates that access on 23rd Street is prohibited to non-DHL users, in practice such prohibitions are not absolute when bicyclists are concerned.

TABLE 4.H-2
WIND SPEEDS AT MID-STREET (BICYCLE) TEST POINTS

Test Point	Existing	Existing plus Project	Cumulative (including Project)
	Wind Speed Exceeded 1 hour/year (mph)	Wind Speed Exceeded 1 hour/year (mph)	Wind Speed Exceeded 1 hour/year (mph)
162	25	34	33
175	19	23	37
176	35	29	25
177	28	30	31
178	24	24	25
179	29	24	23
180	25	27	27
181	30	29	30
182	28	29	28
183	31	29	29
184	31	35	36
185	33	23	23
186	27	21	21
187	38	26	26
188	34	26	27
189	26	31	34
190	34	26	27
191	31	27	23
192	19	20	21

4.H.3 Shadow

The Shadow subsection discusses the shadow impacts of the proposed project on open spaces and recreation facilities near the project site. The Environmental Setting discussion describes the existing and planned publicly accessible open spaces and recreation facilities near the project site that could potentially be affected by the proposed project; identifies applicable regulations related to shadow impacts; and summarizes the regulatory framework related to shadow.

The impact analysis describes whether the proposed project would cast shadow on parks and open spaces near the project site so as to reduce the use and enjoyment of those spaces. For informational purposes, this discussion also describes shadow impacts of new buildings on proposed public open space on the project site. The discussion also describes the cumulative shadow effects of the proposed project, combined with past, present, and reasonably foreseeable future projects.

The potential extent of shadow impacts of the proposed project is based on a digital shadow analysis prepared by an independent consultant that shows the location of project shadow on

existing and planned public open spaces on and near the proposed project at representative times of the year throughout the day between one hour after sunrise to one hour before sunset (see "Approach to Analysis," below).[16]

4.H.3.1 Environmental Setting

Existing Open Spaces On and Near the Project Site

There are no existing publicly accessible open space areas within the project site. There are three existing publicly accessible open spaces within approximately 0.25 miles of the project site boundary, listed below. These open spaces are depicted in Figure 4.H-8, in the Impacts analysis, below.

Recreation and Park Department Properties

Esprit Park is approximately 0.25 miles northwest of the project site along the northern side of 20th Street at Minnesota Street. It is an approximately 1.8-acre field bordered with picnic tables, benches, and redwood trees. A perimeter path encompasses the north, east, and south sides of the park.

Other Publicly Accessible Open Spaces

Woods Yard Park is about 0.15 miles west of the project site and bounded by 22nd Street to the north, Indiana Street to the west, Minnesota Street to the east, and a San Francisco Municipal Transportation Agency (SFMTA) bus storage and maintenance facility (Woods Yard) to the south. This open space is an approximately 20,000-square-foot park with a mix of hardscape and elevated grassy areas, a children's play area, seating areas, and trees. It is owned by the SFMTA and is accessible to the public.

Warm Water Cove Park is less than 0.01 miles south of the project site along the waterfront at the eastern terminus of 24th Street. However, there is no direct access from the project site across Warm Water Cove to the park, so walking distance is about 0.3 miles. Warm Water Cove Park is an approximately 1.85-acre publicly accessible open space owned by the Port of San Francisco.

Progress Park is 0.5-acre Caltrans property adjacent to the I-280 freeway, west of Indiana Street and north of 25th Street, and about 0.3 miles southwest of the project site. Developed as a community-led project, this park includes landscaping (trees, native grasses, and other plants), paths, benches, a pull up bar, bocce court, and an enclosed off-leash dog area.

Other publicly accessible open space facilities include the San Francisco Bay Trail, two landscaped sections of City rights-of-way—Angel Alley and Minnesota Grove—and a publicly accessible mid-block walkway built as part of the 1201 Tennessee Street project. The Bay Trail, a planned 500-mile walking and cycling path around the entire San Francisco Bay running through all nine Bay Area counties, 47 cities, and across seven toll bridges. While not yet completed or fully continuous, the

[16] PreVision Design, Shadow Analysis Report for the Proposed Potrero Power Plant Project Per SF Planning and California Environmental Quality Act (CEQA) Standards, March 29, 2018. The shadow study is included in Appendix F.

trail is currently more than 350 miles long and connects communities to parks, open spaces, schools, transit, and also provides an alternative commute corridor. The ultimate goal of the Bay Trail is to build a continuous shoreline bicycle and pedestrian path. In the project vicinity, the existing Bay Trail is on the Illinois Street sidewalks, west of the project site. As described in Chapter 2, Project Description, the future Bay Trail configuration would be extended through the project site, in coordination with a similar planned route through the Pier 70 Mixed-Use District project site. Angel Alley, also a community-led project, occupies the west side of the portion of the Tennessee Street right-of-way that extends south from the street's dead end (for motor vehicles) south of 22nd Street to connect with the dead end of 22nd Street at Tubbs Street. This sloping linear open space, adjacent to Muni's Woods Yard to the west, is planted with palm trees and succulents and separated from the paved bicycle and pedestrian pathway by a stone retaining wall. It is about 0.1 mile west of the project site. Minnesota Grove occupies the east side of the Minnesota Street right-of-way south of 24th Street, about 0.25 mile southwest of the project site. It features a pathway through an extensively landscaped area that includes trees and plants. Finally, the mid-block alley adjacent to 1201 Tennessee Street links Third Street and Tennessee Street north of 22nd Street, connecting with Angel Alley at its west end. The concrete walkway includes plantings on each side.

Planned Open Spaces

The Historic Core Plaza is a planned, approximately 45,000-square-foot publicly accessible plaza within the Pier 70 Historic Core project, which is rehabilitating several historic buildings on Port of San Francisco-owned land on both sides of 20th Street east of Illinois Street.[17] The plaza will be south of Pier 70's Building 113, a long brick building on the south side of Illinois Street and adjacent to the larger Pier 70 Mixed-Use District project to the south. The primary pedestrian access to the plaza will be from 20th Street through an atrium within Building 113. It will also be accessible from the project site from the south and east.[18] The Historic Core Plaza is shown in the project shadow analysis graphics, Figures 4.H-8 – 4.H.23, below.

In addition, the approved Pier 70 Mixed-Use District project, just north of the project site, will include an extensive network of publicly accessible open space on that site, including 20th Street Plaza, Irish Hill Playground, Market Square Slipways Commons, the Waterfront Terrace, and the Waterfront Promenade. These open spaces are shown in the cumulative shadow analysis graphics, Figures 4.H-24 – 4.H.39, below.

[17] Note that the Historic Core Plaza was planned as of the date of the project NOP. As on September 2018, this plaza has been completed and is open to the public. The completed status of the plaza does not alter the analyses of shadow impacts within this section.

[18] Crane Cove Park is another planned open space on Port-owned land. It will be a 9-acre open space at 18th and Illinois streets, on an unused portion of the Pier 70 shipyard site. Construction began in 2017. This open space is too far north of the project site to be depicted on the shadow diagrams in this analysis.

4.H.3.2 Regulatory Framework

Local Regulations

San Francisco General Plan

Recreation and Open Space Element

***Policy 1.9*:** Preserve sunlight in public open space.

Urban Design Element

***Objective 3*:** Moderation of Major New Development to Complement the City Pattern, the Resources to be Conserved, and the Neighborhood Environment.

Accompanying text as part of "Fundamental Principles for New Development" states, "Plazas or parks located in the shadows cast by large buildings are unpleasant for the user.

"A. Large buildings can be oriented to minimize shadows falling on public or semi-public open spaces.

"B. The height and mass of tall, closely packed buildings can be shaped to permit sunlight to reach open spaces."

***Policy 3.4*:** Promote building forms that will respect and improve the integrity of open spaces and other public areas.

Central Waterfront Area Plan

***Policy 5.2.6*:** Ensure quality open space is provided in flexible and creative ways, adding a well-used, well-cared for amenity for residents of a highly urbanized neighborhood. Private open space should meet the following design guidelines:

A. Designed to allow for a diversity of uses, including elements for children, as appropriate.

B. Maximize sunlight exposure and protection from wind.

C. Adhere to the performance-based evaluation tool.

San Francisco Planning Code

Planning Code Section 101.1/Proposition M

In November 1986, the voters of San Francisco approved Proposition M (the Accountable Planning Initiative), which added section 101.1 to the Planning Code and established eight Priority Policies. These Priority Policies are the basis upon which inconsistencies with the General Plan are resolved. Priority Policy No. 8 calls for the protection of parks and open space and their access to sunlight and vistas.

Prior to issuing a permit for any project that requires an initial study under CEQA; prior to issuing a permit for any demolition, conversion, or change of use; and prior to taking any action that requires a finding of consistency with the General Plan, the City is required to find that the proposed project or legislation would be consistent with the Priority Policies.

Planning Code Section 295/Proposition K

In 1984, San Francisco voters approved an initiative known as "Proposition K, The Sunlight Ordinance," which was codified in 1985 as Planning Code section 295. Section 295 prohibits the approval of "any structure that would cast any shade or shadow upon any property under the jurisdiction of, or designated for acquisition by, the Recreation and Park Commission" if the Planning Commission, upon the recommendation of the General Manger of the Recreation and Park Department and after review and comment by the Recreation and Park Commission, has found that "the proposed project will have any adverse impact on the use of the property … because of the shading or shadowing that it will cause, unless it is determined that the impact would be insignificant."

The shadow analysis determined that no properties under the jurisdiction of the Recreation and Park Commission are on the project site or within the potential reach of proposed project shadow.[19] Therefore, Planning Code section 295 does not apply to the proposed project.

4.H.3.3 Impacts and Mitigation Measures

Significance Criteria

The following significance criterion is from Appendix B of the San Francisco Planning Department's Environmental Review Guidelines, (which is the planning department's Initial Study Checklist) and is used to determine the level of impact related to shadow. Implementation of the proposed project would have a significant effect related to shadow if the project would:

- Create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas.

Approach to Analysis

The project features that have the potential to result in potential shadow impacts are the same as those described above under Wind (p. 4.H-1), including amendments to the San Francisco General Plan and Planning Code and creating a new Potrero Power Station Special Use District. Height limits on the project site would be increased. Additionally, the project would construct some 6.2 acres of publicly accessible open space.

Methodology

To evaluate the shadow impacts of the proposed project, a 3D virtual model of the project was prepared. The model includes the project site, potentially affected open spaces, the surrounding urban environment, and cumulative development, which, for the shadow analysis, consists of the Pier 70 Mixed-Use District project.

The purpose of this analysis is to inform decision-makers of the potential effects of the proposed project's shadow on existing public parks and publicly accessible open spaces, and to determine

[19] PreVision Design, Shadow Analysis Report for the Proposed Potrero Power Plant Project Per SF Planning and California Environmental Quality Act (CEQA) Standards, March 29, 2018

whether or not the project would create new shadow that would substantially affect the use and enjoyment of these facilities, a significant impact under CEQA.

The shadow model considers the proposed project at full buildout, like the wind tunnel analysis described above. Specific architectural designs for the buildings within the project site are not available at this time. Unlike the wind model, the shadow analysis assumes that all project buildings would reach the maximum allowable height (65 to 300 feet) and cover the entire footprint of each block on the project site, as shown in Figure 2-7 in Chapter 2, Project Description. The shadow model does not include required building setbacks at upper stories, and is, therefore, a worst-case scenario.[20]

The following scenarios were considered in the shadow model:

- Existing
- Existing plus Project
- Cumulative (with Project)

The existing-plus-project scenario compares shadow cast under existing conditions to shadow that would be cast by the proposed project. The cumulative scenario compares shadow cast under existing conditions to shadow that would be cast by the proposed project and the Pier 70 development; potential impacts to the planned Pier 70 publicly accessible open spaces are evaluated. The Pier 70 development assumed maximum building volumes, ranging between 66 to 106 feet in height depending on the parcel. Several proposed projects on Third, Tennessee, and Mariposa streets were initially considered for the cumulative analysis but were excluded, as the farthest potential reach of their shadows was determined to not reach the affected open spaces reviewed by the shadow analysis.[21]

Shadow Diagrams

In order to provide a visual understanding of the location, size, and extent of the new shading, graphics were prepared to accompany the qualitative analysis. The shadow diagrams graphically depict the movement of project shadows across the project site and surrounding area on four representative days of the year from one hour after sunrise to one hour before sunset:[22] the summer solstice (June 21, the longest day of the year, when the sun is highest in the sky and shadows are the shortest at any given time of day); the spring/autumn equinoxes (March 20/September 22, when the sun's position is nearly identical to the opposite equinox and represent the midway point between the winter and summer solstices); and the winter solstice (December 20, the shortest day of the year, when the sun is lowest in the sky and shadows are the longest at any given time of day).

---

20 Trees and landscaping are not included in the model. If a park is surveyed, existing shading from trees and landscaping may be described qualitatively.

21 PreVision Design, Shadow Analysis Report for the Proposed Potrero Power Plant Project Per SF Planning and California Environmental Quality Act (CEQA) Standards, March 29, 2018. Projects excluded from cumulative shadow analysis included 777, 888, 901, and 950 Tennessee Street; 2092, 2177, 2230, and 2290 Third Street; and 595 Mariposa Street.

22 The period analyzed is from the first hour after sunrise until the last hour before sunset, because before and after these hours, shadows are extremely long and move very quickly across the ground. Because of this, much of the city other than areas with no buildings or other structures is in shadow during the first and last hours of sunlight.

For each of these days (summer solstice, spring/autumn equinoxes, and winter solstice), this section presents representative shadow diagrams at five times of day: one hour after sunrise; the beginning, middle, and end of the midday period of peak use (10 a.m., 12 p.m., and 3 p.m.); and one hour before sunset. Presenting a series of shadow diagrams from the same day demonstrates how shadow moves across the space and expands and contracts over a specific period of time. They represent a representative range of dates and times, including the time of peak midday use of open space on the longest day of the year, on the equinoxes (when day and night are of approximately equal length), and on the shortest day of the year. From these shadow diagrams, shadow impacts on particular open spaces are described and evaluated.

Impact Evaluation

Impact WS-3: The proposed project would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. (*Less than Significant*)

Introduction

Buildout as proposed by the project would increase shadow cast on and near the project site. The project site does not currently contain any developed or accessible public open space, but, as described above under Project Features, p. 4.H-7, publicly accessible open space would be constructed within the project site as part of the proposed project. Since these open spaces do not yet exist, project shadow on these open spaces would not interfere with any existing recreational use that may rely on access to sunlight and would have no impact under CEQA. For informational purposes only, this section describes and evaluates shadow that would be cast by the proposed project on publicly accessible open space to be constructed within the project site as part of the proposed project. This discussion appears on p. 4.H-49, following the CEQA impact analysis.

As can be seen in **Figure 4.H-8**, **Annual Net New Project Shadow Compared to Existing Conditions**, which presents an annual composite image of locations that would be newly shaded by the proposed project, shadow from the proposed project would not reach Esprit Park, a Recreation and Parks Department property. This is because Esprit Park is beyond the maximum extent of shadow from the tallest proposed building, the 300-foot tower on Block 6, during the hours covered by the shadow analysis. Likewise, due to their distance and/or location relative to the project site, the following existing and planned open spaces would not sustain any new shadow from the proposed project: Warm Water Cove Park, Progress Park, Minnesota Grove, and the planned Historic Core Plaza at Pier 70. Therefore, these open spaces are not discussed further.

Existing open space/recreation facilities within potential reach of project shadow include Woods Yard Park, the existing San Francisco Bay Trail route along Illinois Street, and Angel Alley and the 1201 Tennessee Street mid-block walkway. **Figure 4.H-9** through **Figure 4.H-23**, **Project Shadow**, depict existing-plus-project shadow for five representative times on the summer solstice (June 21), the spring/fall equinoxes (March 20/September 22), and the winter solstice (December 20).[23]

[23] These dates can vary slightly from year to year.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-8
Annual Net New Project Shadow Compared to Existing Conditions

Proposed Potrero Power Plant Development (PPP)
Existing Shadow (current conditions)
Net New Shadow from PPP
Profiles of PPP Shadow Vectors
Publicly Accessible Open Spaces (proposed except where noted)

Proposed On-Site Open Spaces
A - Waterfront Park
B - Louisiana Paseo
C - Power Station Park

Existing Off-Site Open Spaces
1 - 1201 Tennessee Street mid-block walkway
2 - Angel Alley
Note: Progress Park and Minnesota Grove are south of the area mapped.

San Francisco Bay Trail
Existing
Proposed

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-9
Project Shadow, Summer Solstice (June 21), 6:46 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-10
Project Shadow, Summer Solstice (June 21), 10:00 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-11
Project Shadow, Summer Solstice (June 21), 12:00 noon

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-12
Project Shadow, Summer Solstice (June 21), 3:00 p.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-13
Project Shadow, Summer Solstice (June 21), 7:36 p.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-14
Project Shadow, Fall Equinox (September 20), 7:57 a.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-15
Project Shadow, Fall Equinox (September 20), 10:00 a.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-16
Project Shadow, Fall Equinox (September 20), 12:00 noon (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-17
Project Shadow, Fall Equinox (September 20), 3:00 p.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.I-18
Project Shadow, Fall Equinox (September 20), 6:09 p.m. (Spring Similar)

Proposed Potrero Power Plant Development (PPP)
Existing Shadow (current conditions)
Net New Shadow from PPP
Profiles of PPP Shadow Vectors
Publicly Accessible Open Spaces (proposed except where noted)

Proposed On-Site Open Spaces
A - Waterfront Park
B - Louisiana Paseo
C - Power Station Park

Existing Off-Site Open Spaces
1 - 1201 Tennessee Street mid-block walkway
2 - Angel Alley
Note: Progress Park and Minnesota Grove are south of the area mapped.

San Francisco Bay Trail
Existing
Proposed

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-19
Project Shadow, Winter Solstice (December 20), 8:19 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-20
Project Shadow, Winter Solstice (December 20), 10:00 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-21
Project Shadow, Winter Solstice (December 20), 12:00 noon

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-22
Project Shadow, Winter Solstice (December 20), 3:00 p.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-23
Project Shadow, Winter Solstice (December 20), 3:54 p.m.

Shadow on Existing Open Spaces

Woods Yard Park

The proposed project would cast new shadow on Woods Yard in the early morning (before 8:30 a.m.) for about three weeks in March, around the spring equinox, and again in the early morning (before 8:30 a.m.) in late September and early October, around the fall equinox. This new shadow would be cast by the proposed 300-foot-tall tower on Block 6. Project shadow would cover a maximum of about one-third of the park at these early morning times; at its maximum extent, project shadow would reach the playground in the center of the park for a few minutes per day. During these early morning times, shadow would move quickly across the park, and would leave the park entirely by about 8:30 a.m. Because of the limited duration of the shadow during the year, the limited times of shadow on the days when shadow would reach the park, and the relatively small area of shadow coverage, project shadow would not be expected to adversely affect the use of Woods Yard Park.

Angel Alley and 1201 Tennessee Street Mid-Block Walkway

These two open spaces are discussed together because they are essentially contiguous and therefore situated at the same orientation relative to the proposed project. As shown in Figure 4.H-8, very small portions of both of these open spaces would be shaded by the proposed project. This new shadow would fall at the south end of Angel Alley and at the east and west ends of the 1201 Tennessee mid-block alley. The new shadow would reach these open spaces for a few minutes in the early morning in late spring and early summer. Because of the limited duration and extent of the new shadow, it would not adversely affect the use of either of these open spaces.

San Francisco Bay Trail

As noted above, the project proposes to relocate the Bay Trail to the bayside within the project site. At a minimum, the southern portion of this shoreline Bay Trail improvement on the project site would be implemented in the project's Phase 1 of construction (see Figure 2-25, Proposed Project Phasing Plan, in Chapter 2, Project Description). However, the northern portion of the shoreline Bay Trail, which would connect to a similarly relocated Bay Trail segment on the Pier 70 Mixed-Use District project site to the north, likely would not be constructed until both project sponsors are ready to complete joint development of the connecting segments of the Bay Trail. Therefore, and for purposes of a conservative analysis, shadow effects from the proposed project are considered on the existing alignment of the Bay Trail along the Illinois Street sidewalks.

School Yards

There are no public schools located within the shadow fan the proposed project, so no school yards would be affected.

The proposed project would add new shadow to both sidewalks along Illinois Street, from south of 23rd Street to north of 22nd Street, throughout the morning year-round, beginning one hour after sunrise or earlier, and lasting for between about 3 hours and 5½ hours daily, depending on the season. As shown in Figures 4.H-9, -10, -11, -14, -15, -16, -19, and -20, project shadow would be cast on the Illinois Street sidewalks by buildings on Blocks 5, 6, 10, 13, and 14, although not all at

the same time. Most of the project shadow would be cast by buildings on Blocks 5 and 13, which would be closest to Illinois Street and would have relatively wide façades facing Illinois Street. Project shadow would leave both the east and west Illinois Street sidewalks by no later than about 12 noon throughout the year. This section of the Bay Trail is not located along the bay shoreline and does not feature scenic views, seating, landscaping, or other features or amenities that would cause people to linger, and where access to sunlight is an important factor in the use and enjoyment of the trail. As such, this section of the trail functions primarily as a transit corridor for pedestrians, cyclists, runners, and other trail users. Moreover, the length of the affected section of the trail (less than two blocks) is insignificant relative to the overall 350-mile length of the existing Bay Trail along the San Francisco waterfront (a total of 500 miles is planned). Finally, the shadow effect on the trail would be of limited duration during morning hours only, and would be entirely gone by or before noon throughout the year. Therefore, shadow resulting from the project would not substantially affect the use and enjoyment of the existing Bay Trail route.

As noted, the project would relocate the Bay Trail to the bayside within the project site. Shadow on the proposed Bay Trail location is discussed below.

Shadow on Sidewalks in Vicinity of the Project Site

The proposed project would add new shadow to sidewalks in the project vicinity year-round. In addition to Illinois Street, affected sidewalks would include: Third Street near the intersection of 22nd Street; 22nd Street, from Minnesota Street to its eastern extent; 23rd Street, from just west of Third Street to its eastern extent; and small areas along Tennessee, Minnesota, and Indiana streets.

Not all of these sidewalks would be affected throughout the year because of the change in the apparent position of the sun in the sky throughout the year. As with Illinois Street described above, the new shadow would not be in excess of the amount of shadow customarily experienced in urban areas, and this shadow would not be expected to adversely affect pedestrian use of the sidewalks.

Summary of Project Shadow Impacts

As described above, while the proposed project would cast new shadow on existing open spaces, including Woods Yard Park, San Francisco Bay Trail, and sidewalks near the project site, the extent and duration of the increased shadow coverage would be limited and would not be expected to adversely affect the use of these areas. Therefore, shadow impacts of the project would be ***less than significant***.

Mitigation: None required.

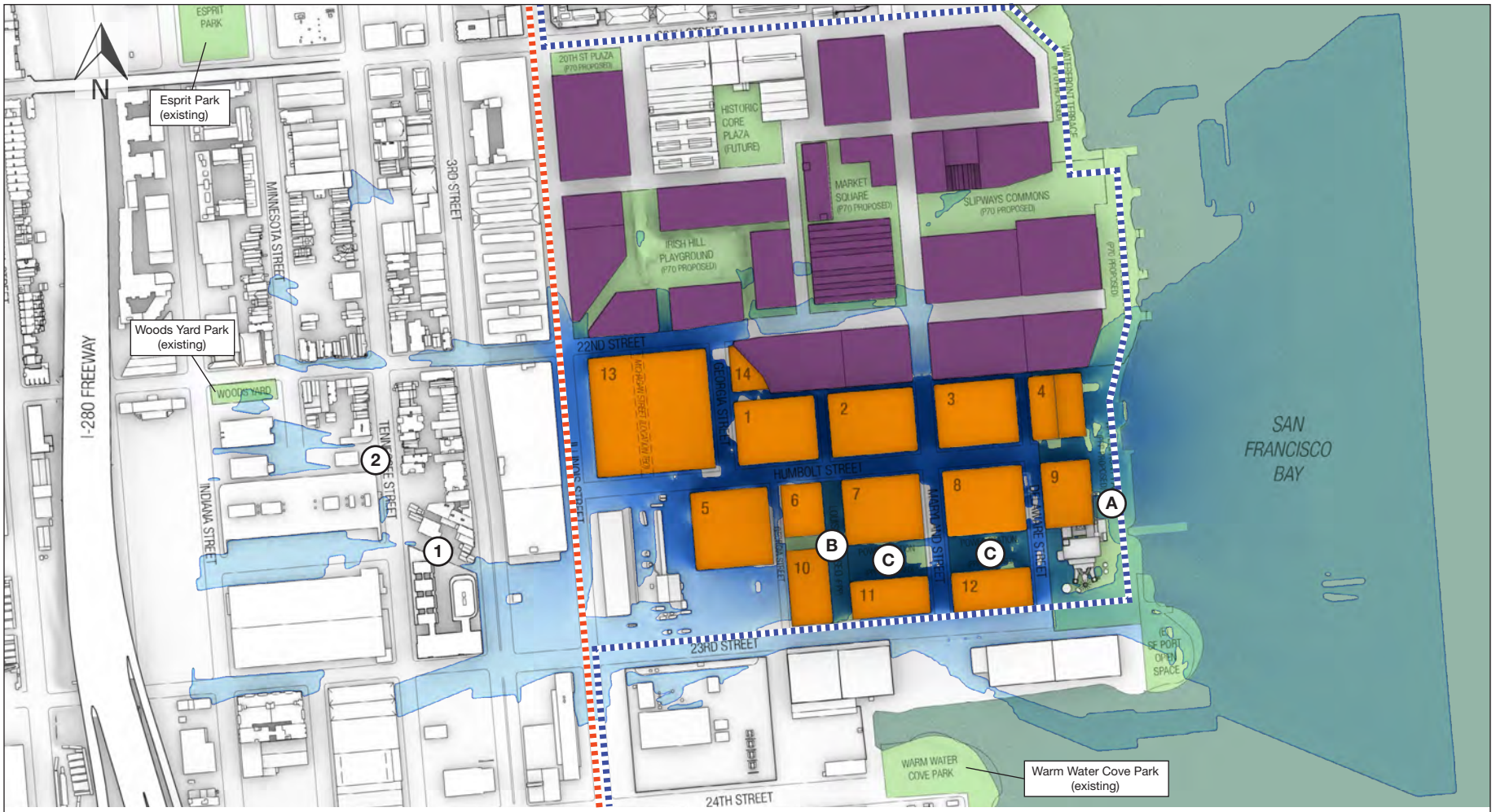
Cumulative Impacts

Impact C-WS-2: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the project vicinity, would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas. (*Less than Significant*)

As described above under Methodology, for shadow analysis, the cumulative context includes the proposed project and the approved Pier 70 Mixed-Use District project. **Figure 4.H-24**, **Annual Net New Cumulative Shadow Compared to Existing Conditions**, presents an annual composite image of shadow cast by the proposed project and the Pier 70 Mixed-Use District project. Open spaces proposed at the Pier 70 project site are also shown. **Figure 4.H-25** through **Figure 4.H-39**, **Cumulative Shadow**, depict cumulative shadow conditions for the same representative times of day and year as depicted in Figures 4.H-9 through 4.H-23, above.

The proposed project and the Pier 70 Mixed-Use District project would not combine to add shadow to any existing publicly accessible open spaces, except the existing Bay Trail route, along Illinois Street. During most of the year, shadow from the two projects would not overlap except near the intersection of 22nd and Illinois streets, as shadow from the Pier 70 project would fall on Illinois Street farther north than would shadow from the proposed project. However, around the winter solstice, when the sun is at its most southerly point in the sky at sunrise, shadow from the two projects would overlap between 22nd Street and midway between 22nd and 20th streets in the early morning around 8:30 a.m., for about 90 minutes. As under existing-plus-project conditions, cumulative shadow on Illinois Street cast by the proposed project and the Pier 70 project would last for between about 3 hours and 5½ hours per day in the morning throughout the year. As stated above, these sidewalks do not feature scenic views or other features that would cause people to linger and are therefore used simply as a means of walking from one place to another. Additionally, it is noted that the Bay Trail route would be relocated from Illinois Street to the San Francisco Bay shoreline with buildout of the proposed project and the adjacent Pier 70 project. Therefore, under cumulative conditions, the Illinois Street sidewalks would no longer be part of the trail route. Because there would be no cumulative shadow effect on any other publicly accessible open spaces, because cumulative shadow on the Illinois Street sidewalks would not adversely affect the use of the existing Bay Trail route, and because the proposed project, together with the approved Pier 70 project, would relocate the Bay Trail to the shoreline, the cumulative shadow impact would be ***less than significant***.

Mitigation: None required.



SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-24
Annual Net New Cumulative Shadow Compared to Existing Conditions

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-25
Cumulative Shadow, Summer Solstice (June 21), 6:46 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-26
Cumulative Shadow, Summer Solstice (June 21), 10:00 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-27
Cumulative Shadow, Summer Solstice (June 21), 12:00 noon

SOURCE: Prevision Design

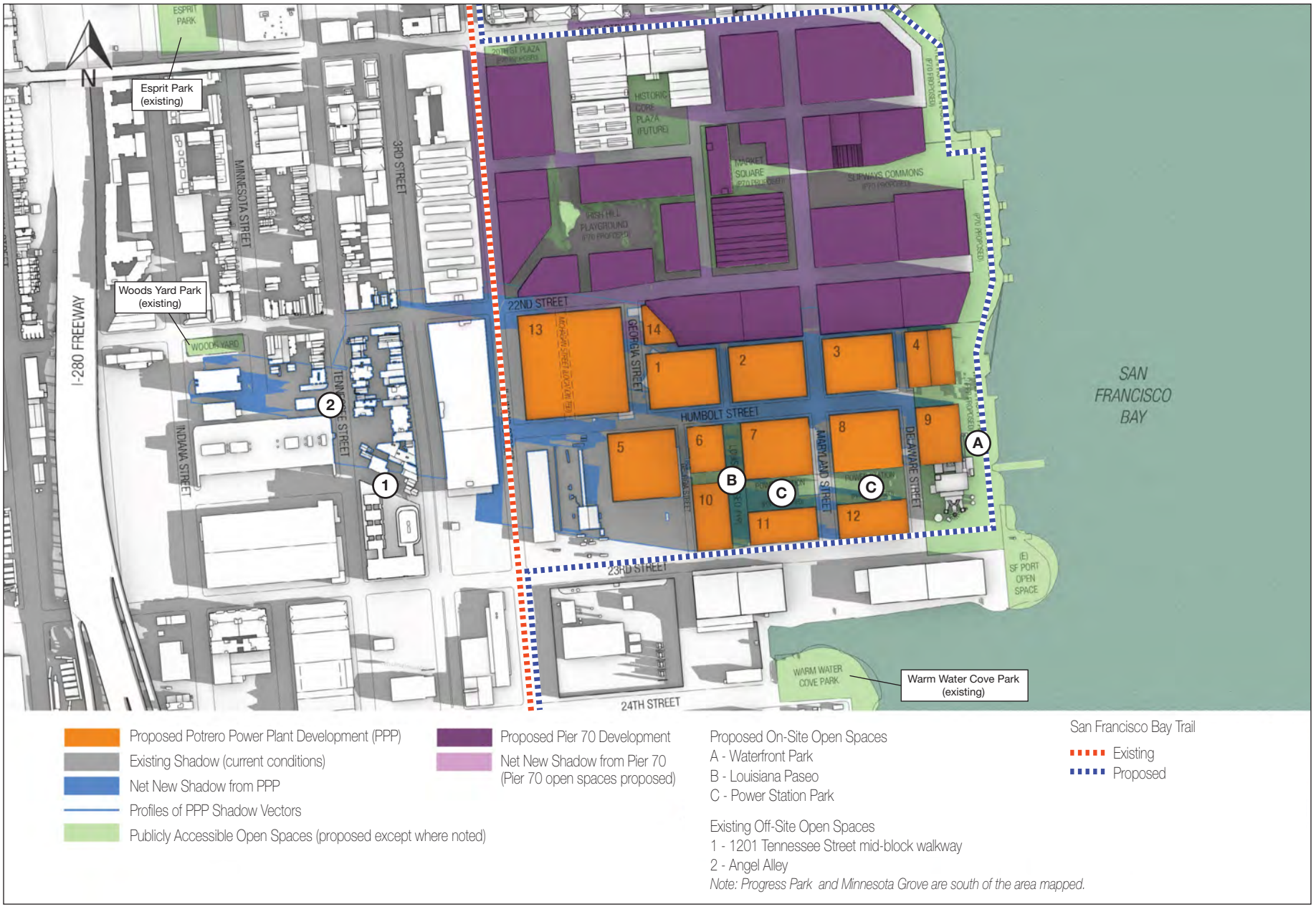
Potrero Power Station Mixed-Use Development Project

Figure 4.H-28
Cumulative Shadow, Summer Solstice (June 21), 3:00 p.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-29
Cumulative Shadow, Summer Solstice (June 21), 7:36 p.m.



SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-30
Cumulative Shadow, Fall Equinox (September 20), 7:57 a.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-31
Cumulative Shadow, Fall Equinox (September 20), 10:00 a.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-32
Cumulative Shadow, Fall Equinox (September 20), 12:00 noon (Spring Similar)

SOURCE: Prevision Design

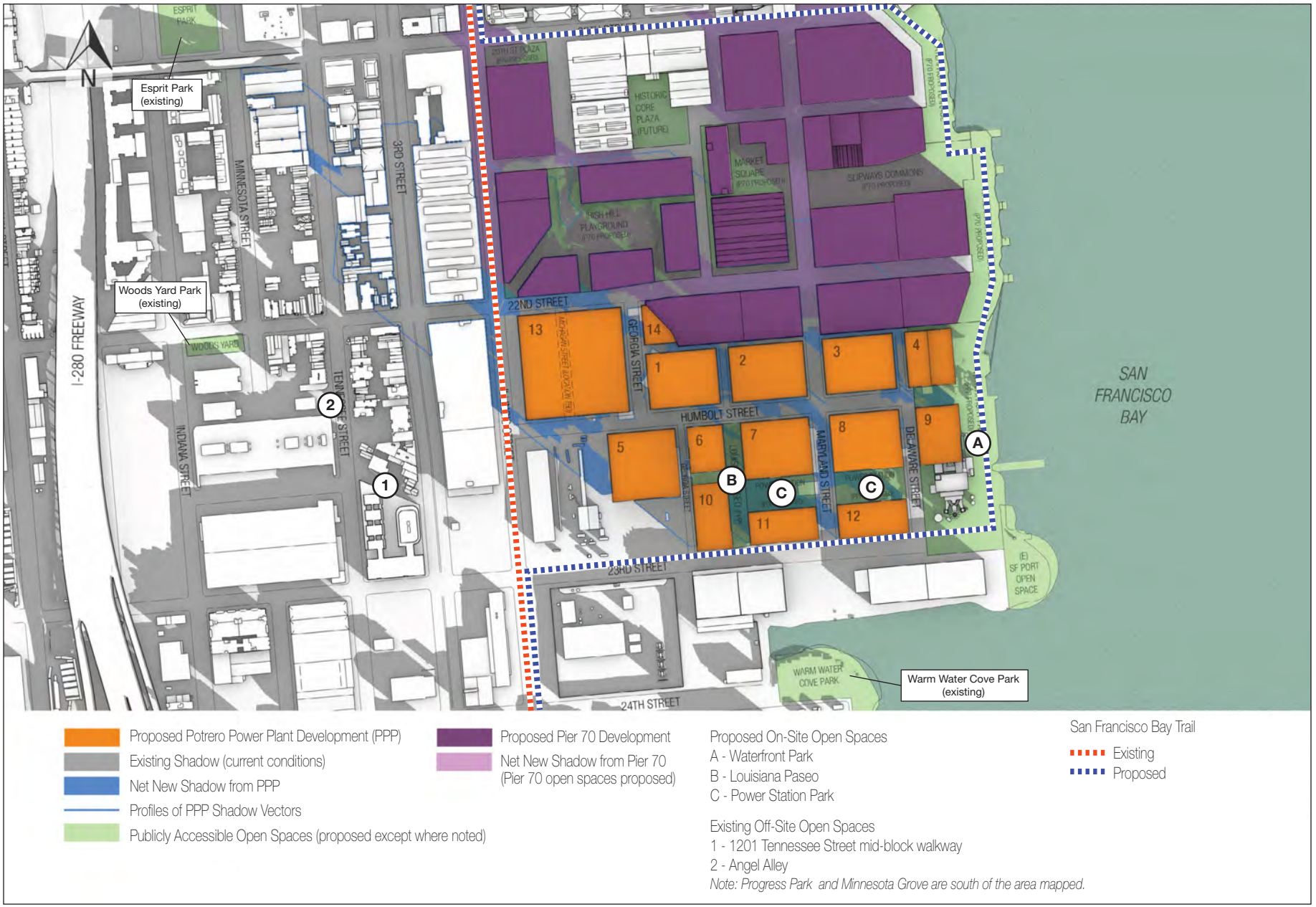
Potrero Power Station Mixed-Use Development Project

Figure 4.H-33
Cumulative Shadow, Fall Equinox (September 20), 3:00 p.m. (Spring Similar)

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

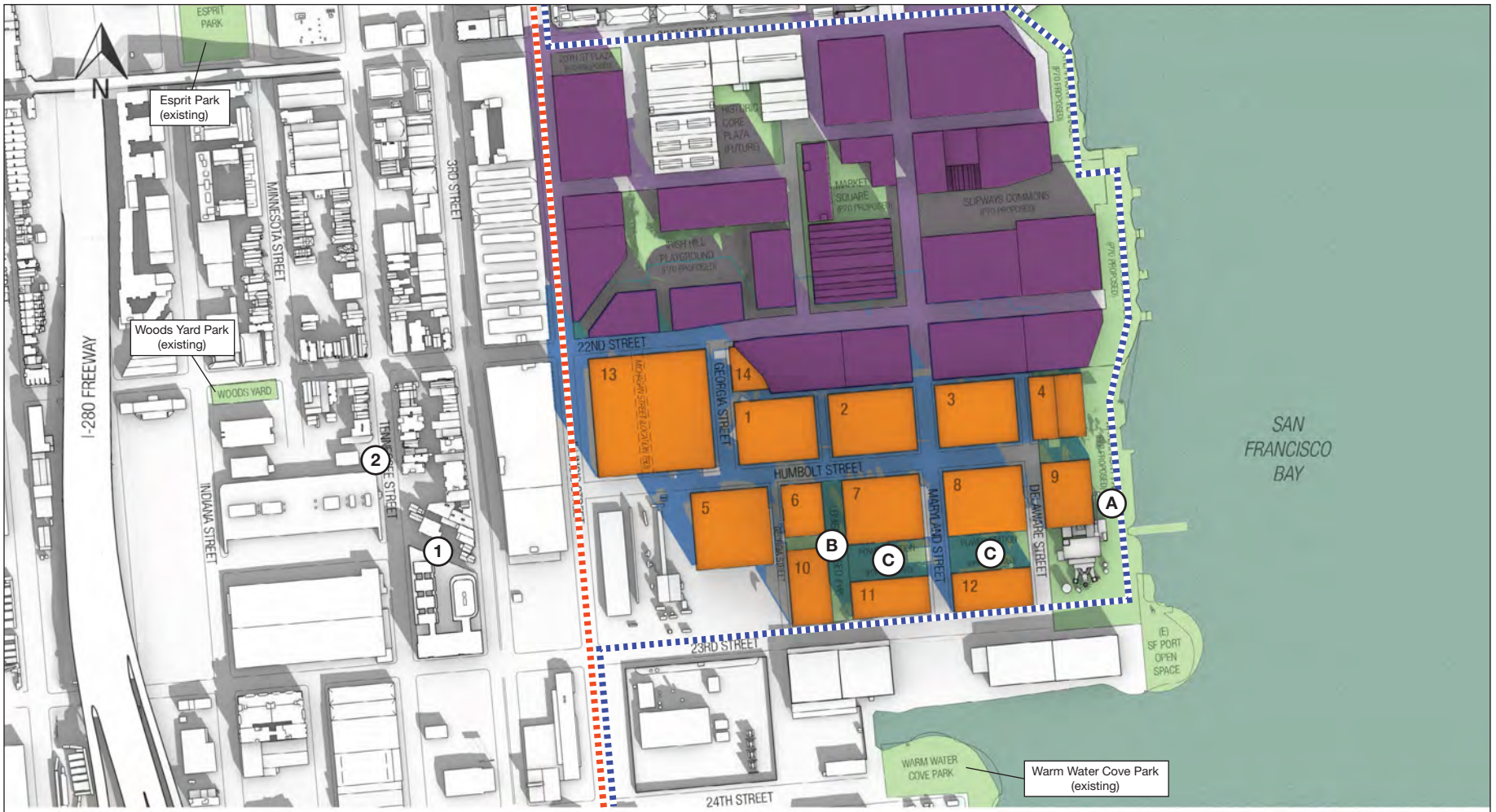
Figure 4.H-34
Cumulative Shadow, Fall Equinox (September 20), 6:09 p.m. (Spring Similar)



SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-35
Cumulative Shadow, Winter Solstice (December 20), 8:19 a.m.



SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-36
Cumulative Shadow, Winter Solstice (December 20), 10:00 a.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-37
Cumulative Shadow, Winter Solstice (December 20), 12:00 noon

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-38
Cumulative Shadow, Winter Solstice (December 20), 3:00 p.m.

SOURCE: Prevision Design

Potrero Power Station Mixed-Use Development Project

Figure 4.H-39
Cumulative Shadow, Winter Solstice (December 20), 3:54 p.m.

Supplemental Information

Shadow on Proposed Onsite Open Spaces

The following characterizes the shadow that would be cast by existing and proposed buildings on each of the four proposed onsite open spaces, and is presented for informational purposes. The onsite open spaces would be publicly accessible, but would not be under the jurisdiction of the Recreation and Park Commission and would not be subject to Planning Code section 295. Because none of the onsite open spaces would exist but for the proposed project, the CEQA analysis covers impacts of a project on existing conditions, and not on elements of the project itself. Therefore, there is no shadow impact, under CEQA, to these open spaces, which do not currently exist.

Waterfront Park. The proposed Waterfront Park, which would include the future Bay Trail route, would be in sunlight in the morning year-round. Project buildings would cast shadow on Waterfront Park in the afternoon year-round. In late fall and early winter, shadow would begin to fall on the park after about noon. In late winter through early spring, and in late summer through early fall, shadow would fall on the park after about 12:30 p.m. From late spring through early summer, shadow would begin to reach the park after about 1 p.m. Shadow would be cast primarily by adjacent buildings to the west, which would be 65 and 85 feet in height, with buildings 85 to 125 feet tall west of Delaware Street also casting some additional late afternoon shadow. In addition, the existing Unit 3 Power Block, which is up to about 143 feet in height at the elevator shaft, would cast substantial shadow on the central and southern parts of the proposed park.[24]

Louisiana Paseo. Because the Louisiana Plaza would be oriented generally north-south, the only times it would be without shadow would be when the sun is essentially due south in the sky; that is, around noon or around 1 p.m. during daylight savings time. It would be shaded by project buildings to the east (125 feet and 85-180 feet in height) in the morning, and to the west (125 feet and up to 300 feet in height) in the afternoon throughout the year.

Power Station Park. The proposed project would cast shadow on Power Station Park during much of the day throughout the year, with shadow being cast by buildings to the south (125 feet and 95 feet in height) and to the west (125 feet tall).

Rooftop Soccer Field.[25] Shadow would be cast on the rooftop soccer field by the adjacent 180-foot-tall tower on Block 5 and by the 300-foot-tall tower on Block 6, to the northeast, in the early morning hours from late spring through early summer. A small amount of additional shadow would be cast on the soccer field by the 125-foot-tall building on Block 10, to the east, in the morning, year-round. Shadow would leave the soccer field by late morning every day of the year.

[24] Although, as noted in the wind analysis earlier in this section, the tallest part of the Unit 3 power block is a steel frame structure, with attached concrete elevator tower, that is partially permeable, this permeability results in less diminution, compared to a solid structure, in shadow impact than in wind impact. This is because the interior structures within the steel frame cast shadow in many instances when the frame itself would not.

[25] Shadow does not appear on the rooftop soccer field in Figures 4.H-9 through 4.H-23 because the shadow modeling does not depict shadow cast on building roofs. This discussion describes estimated shadow based on the figures.

As can be seen in Figures 4.H-25 through 4.H-39, because Pier 70 is north of the project site, cumulative (Pier 70 Mixed-Use District project) development would add very little shadow to the proposed project's onsite open spaces.

The Pier 70 buildings would add shadow to the northern part of Waterfront Park (including the future Bay Trail route), but only in the late afternoon (after about 4 p.m.) from late spring through early summer. At other times of the day/year, shadows from Pier 70 buildings would not reach the proposed open spaces on the project site.

As can be seen on Figures 4.H-25 through 4.H-39, the proposed project could cast shadow on the approved Pier 70 Mixed-Use District project's Irish Hill Playground and Slipways Commons. However, shadow from the project buildings would fall in areas already in shadow from the Pier 70 buildings and no net new shading would occur. The proposed project would add new shadow to the southern end of the Pier 70 project's Waterfront Promenade (including the future Bay Trail route) in late afternoon, during most of the year, except between early spring and late summer. However, for the most part project shadow on the Pier 70 project's Waterfront Promenade would overlap with shadow from Pier 70 project's buildings.

This page intentionally left blank

4.I Biological Resources

4.I.1 Introduction

Section 4.I, Biological Resources, begins with a description of the existing conditions for terrestrial and marine biological resources that occur or have the potential to occur on the project site or in the immediate vicinity. Regulations and guidelines relevant to biological resources are discussed next, followed by an impact analysis that evaluates the potential effects on biological resources that would result from construction and operation of the proposed project. Mitigation measures that would avoid or reduce impacts to less-than-significant levels are identified. Cumulative effects of the proposed project in combination with past, present, and reasonably foreseeable future projects are discussed. Appendix G provides additional supporting information on biological resources.

4.I.2 Environmental Setting

Study Area and Data Sources

This section identifies project study areas for both terrestrial and marine biological resources. Aside from database searches, a fixed buffer area is not defined for the study areas; however, the proposed project's potential area of influence relevant to each biological resource was considered in order to assess potential impacts to biological resources. Information on natural communities, plant and animal species, and sensitive biological resources was obtained from regional databases, plans, and reports relevant to the proposed project, including the California Department of Fish and Wildlife Natural Diversity Database,[1] the California Native Plant Society Electronic Inventory,[2] the U.S. Fish and Wildlife Service,[3] the National Oceanic and Atmospheric Administration Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay,[4] long-term regional studies such as the Regional Monitoring Program for Water Quality in San Francisco Bay,[5] the Interagency Ecological Program for San Francisco Bay,[6] standard biological literature, eBird.org,[7]

1 California Department of Fish and Wildlife (CDFW), California Natural Diversity Database (CNDDB) Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, accessed August 13, 2018.

2 California Native Plant Society (CNPS), Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, *http://www.rareplants.cnps.org/result.html?adv=t&quad=3712264:3712274,* accessed August 13, 2018.

3 U.S. Fish and Wildlife Service (USFWS), My Project, IPaC Trust Resource Report and Official Species List of Federally Endangered and Threatened Species that may occur in the Potrero Power Station Mixed-Use Development Project location, and/or may be affected by the proposed project, August 13, 2018.

4 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.

5 San Francisco Estuary Institute and the Aquatic Science Center, Clean Water Program, *http://www.sfei.org//cleanwater,* accessed August 17, 2015.

6 Interagency Ecological Program, Cooperative Ecological Investigations in the San Francisco Estuary since 1970, *http://www.water.ca.gov/iep/,* accessed August 18, 2015.

7 eBird: Warm Water Cove Park Hotspot, *https://ebird.org/hotspot/L1027305,* accessed January 19, 2018.

biological reports and studies on other waterfront locations in the project vicinity,[8,9,10,11] and reconnaissance-level surveys of the project site. Reconnaissance-level botanical and terrestrial wildlife surveys of the project site were conducted on December 19, 2017, to characterize existing conditions, assess habitat quality, and assess the potential presence of special-status species and sensitive natural communities. A reconnaissance survey of marine habitat and wildlife was also conducted on December 19, 2017.

For the purposes of this California Environmental Quality Act (CEQA) assessment, the project study area for terrestrial biological resources includes the project site and adjacent landside areas with similar habitat composition including developed or paved areas with long-standing industrial uses from Mission Creek to the north, Islais Creek to the south, the San Francisco Bay to the east, and the I-280 freeway corridor to the west. The marine/aquatic biological resources study area includes the San Francisco Bay shoreline along the project site and San Francisco Bay Central Bay basin waters immediately adjacent to the project site, although marine resources documented in all waters of the Central Bay basin from the north side of Treasure Island to the San Bruno Shoals, which demark the southern border of Central San Francisco Bay, were considered in this analysis. The shoreline and adjacent San Francisco Bay waters comprising the marine resources study area have been extensively modified from their prior natural condition; however, they remain ecologically productive habitats. **Figure 4.I-1**, **Terrestrial Biological Resources Study Area**, and **Figure 4.I-2**, **Marine Biological Resources Study Area**, depict, respectively, the generalized study areas for the terrestrial and marine biological resources considered in this analysis.

Regional Setting

The project site is located in the San Francisco Bay Area-Delta region, which hosts a diverse variety of natural communities ranging from the open waters of San Francisco Bay and the Delta to salt and brackish marshes to chaparral and oak woodlands. The climate is Mediterranean in nature, with relatively mild, wet winters and warm, dry summers. The high diversity of vegetation and wildlife found in the region is a result of soils, topography, and microclimate diversity that promotes relatively high levels of endemism.[12]

San Francisco Bay is the second largest estuary in the United States and supports numerous marine habitats and biological communities. It encompasses 479 square miles, including shallow mudflats. San Francisco Bay is divided into four main basins: San Pablo or North Bay, Suisun Bay, Central Bay, and South Bay.[13] This assessment focuses on the southernmost portion of the Central Bay basin.

8 Golden Gate Audubon Society and San Francisco Bay Bird Observatory, Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties, prepared by Noreen Weeden and Michael Lynes, September 23, 2009.

9 The Port of San Francisco, Pier 94 Wetland Enhancement Monitoring Report, San Francisco, California, June 1, 2010.

10 Bartley, E., N. Weeden, A. Opkins, M. Ziatunich, and M. Chambers, A Field Guide to 100 Birds of Heron's Head, Islais Creek to Candlestick Point, San Francisco, California, 2010.

11 Coastal Conservancy, Clapper Rail Surveys for the San Francisco Estuary Invasive Spartina Project, prepared by Jen McBroom, Olofson Environmental, Inc., November 2013.

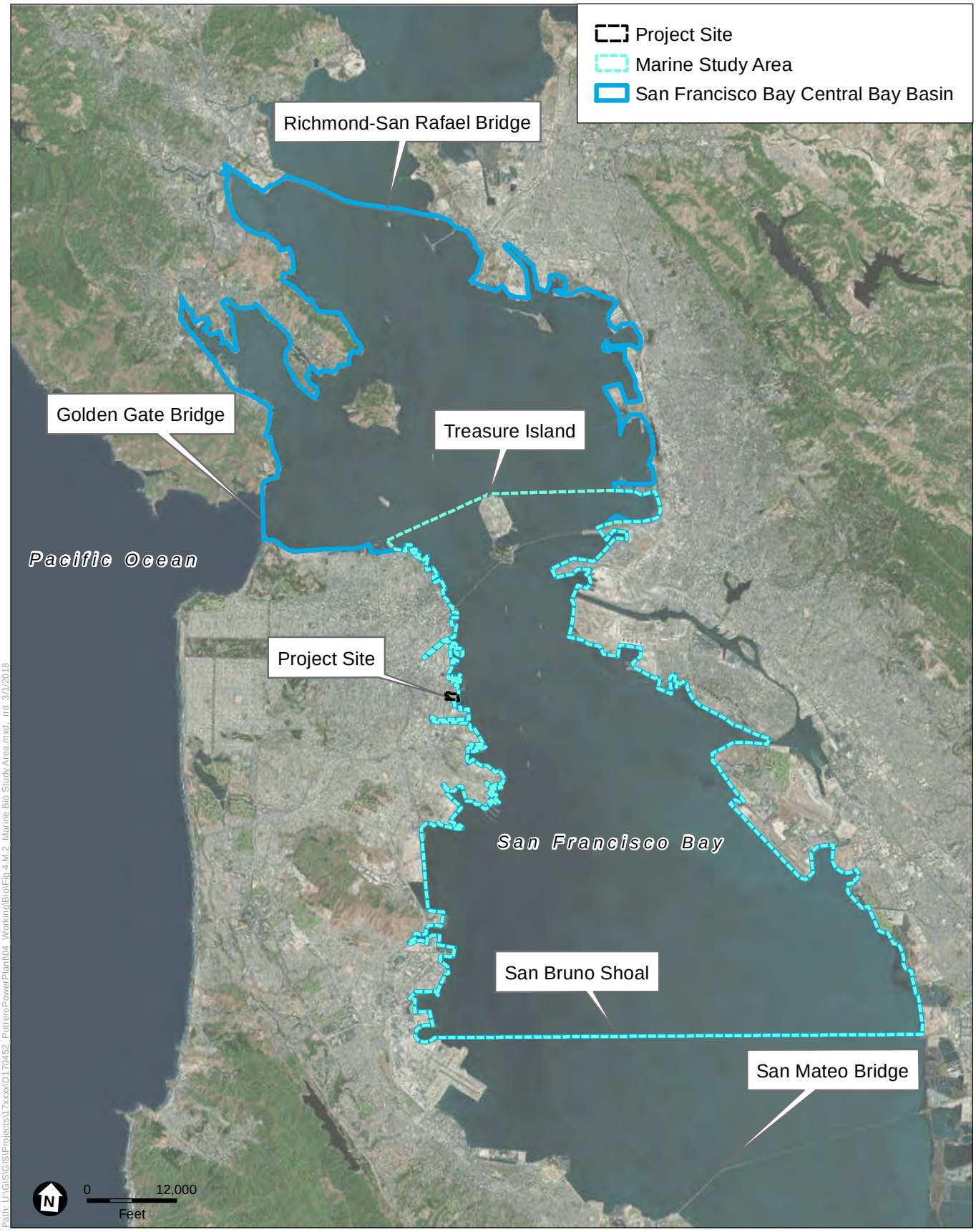
12 Endemism refers to the degree to which organisms or taxa are restricted to a geographical region or locality and are thus individually characterized as endemic to that area.

13 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.

SOURCE: ESA, 2018

Potrero Power Station Mixed-Use Development Project Draft EIR

Figure 4.I-1
Terrestrial Biological Resources Study Area



SOURCE: ESA, 2018

Potrero Power Station Mixed-Use Development Project Draft EIR

Figure 4.I-2
Marine Biological Resources Study Area

Depending on the use, the Central Bay basin of San Francisco Bay has different geographic boundaries. For the purposes of this CEQA analysis, the geographic boundaries for the Central Bay basin are between the Richmond-San Rafael Bridge and the San Bruno Shoal, located 11.5 miles south of the San Francisco-Oakland Bay Bridge. The Central Bay basin connects to the Pacific Ocean through the Golden Gate. The regional setting for purposes of evaluating marine biological resources includes both the shoreline intertidal habitats and the shallow water habitats, also known as the *baylands*[14] and the deeper waters of San Francisco Bay itself that are located in the southernmost area of the Central Bay basin. The marine biological biota found in the Central Bay basin includes the invertebrate *infauna*[15] and mobile *epifauna*[16] that inhabit San Francisco Bay sediments; *sessile*[17] and encrusting invertebrates and marine vegetation on natural and human- made hard substrates; and planktonic organisms, fish, marine mammals, and marine birds that inhabit or use the open waters of San Francisco Bay. These habitats and their associated biological communities are described below in more detail.

Project Site Setting

As discussed in the Project Description under Section 2.D, Existing Land Uses and Site History, the project site is located within the Central Waterfront neighborhood of San Francisco and has a long history of various heavy industrial and power producing land uses, including the former Potrero Power Station.[18,19] Owing to its industrial past, the project site is entirely developed with no natural or undeveloped habitat on landward portions of the site, with the exception of a portion of the Port sub-area located at the terminus of 23rd Street, which is overgrown with plants. Land uses to the north, west, and south of the project site are also developed and support industrial, warehouse, and residential uses. San Francisco Bay and its associated marine habitat lies directly east of the project site.

The former power plant ceased operations in 2011 and twenty-four structures remain on the project site associated with this previous use. Hazardous materials in the soils and groundwater associated with historical land uses within the boundaries of the former power plant are currently undergoing remediation with the oversight of the San Francisco Bay Regional Water Quality Control Board (see Section 4.K, Hazards and Hazardous Materials, for further information). Current uses on the project site include warehouses, parking, vehicle storage, and office space.

14 Goals Project, Baylands Ecosystem Habitat Goals, A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project, U.S. Environmental Protection Agency, San Francisco, California/S.F. Bay Regional Water Quality Control Board, Oakland, California, 1999.

15 Infauna are organisms living in the sediments of the San Francisco Bay floor.

16 Epifauna are organisms living on the surface of the San Francisco Bay floor, or attached to submerged objects or aquatic animals or plants.

17 Sessile means permanently attached or established; not free to move about.

18 The Central Waterfront neighborhood includes the entire Dogpatch neighborhood and the eastern portion of the Potrero Hill neighborhood.

19 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

Terrestrial Vegetation Communities and Wildlife Habitats

Natural communities are assemblages of plant and wildlife species that occur together in the same area, which are defined by species composition and relative abundance. The terrestrial biological resources study area identified in this environmental impact report (EIR) contains a developed/landscaped/ruderal community, which was identified during the terrestrial resources reconnaissance survey on December 19, 2017.

Developed/Landscaped/Ruderal Community

The majority of the project site is paved and currently developed with buildings or electrical substation equipment associated the with prior or current uses on the project site. The terrestrial biological resources study area surrounding and including the project site is also mostly developed, in keeping with the conditions and previous uses of the project site. The only trees within the project site consist of 20 non-native street trees located along Illinois Street and 22nd Street. Thirteen street trees are located along Illinois Street which include cork oak (*Quercus suber*), cajeput (*Melaleuca quinquenervia*) and ginkgo (*Ginkgo biloba*). The proposed project would remove these trees. Approximately seven Japanese blueberry (*Elaeocarpus decipiens*) trees were recently planted on the north side of 22nd Street and are associated with the adjacent PG&E building retrofit. These street trees would be retained under the project. Other vegetation within the project site is considered ruderal, defined as often temporary assemblages of opportunistic non-native plants that thrive in disturbed areas. These areas are limited to few occurrences of non-native and invasive slender oat (*Avena barbata*) and sweet fennel (*Foeniculum vulgare*) with native fat hen (*Atriplex fatua*) along the upper margins of the eastern shoreline riprap and within a narrow band of disturbed ground in the southeast corner of the project site which would become Potrero Point Park under the proposed project. Native coyote bush (*Baccharis pilularis*) and non-native sweet fennel and pampas grass (*Cortaderia jubata*) are dominant in this area. Native salt grass (*Distichlis spicata*) with few other non-native and/or invasive ruderal species comprise the sparse herbaceous groundcover in this area and include Bermuda buttercup (*Oxalis pes-caprae*), cut leaf plantain (*Plantago coronopus*), and smooth cat's ear (*Hypochaeris glabra*).

Developed and ruderal areas can provide cover, foraging, and nesting habitat, albeit somewhat limited compared to natural habitats, for a variety of birds as well as some reptiles and small mammals, especially those that are tolerant of disturbance and human presence. Birds commonly found in such areas are typically seed-eating or accustomed to scavenging human litter. In the terrestrial biological resources study area, these include non-native species, such as house sparrow (*Passer domesticus*), rock pigeon (*Columba livia*), and European starling (*Sturnus vulgaris*). Native bird species found in such an environment include house finch (*Haemorhous mexicanus*), American goldfinch (*Spinus tristis*), white-crowned sparrow (*Zonotrichia leucophrys*), Brewer's blackbird (*Euphagus cyanocephalus*), and mourning dove (*Zenaida macroura*). These species are common to highly developed urban areas and each could nest within the ruderal shrub vegetation, in street trees, or within or on the roofs of buildings of the project site. Other wildlife that are expected on the urbanized project site include striped skunk (*Mephitis mephitis*) and raccoon (*Procyon lotor*), and non-natives such as Virginia opossum (*Didelphis virginiana*), Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), and feral cat. Vacant buildings on the project site (e.g., Station A) can serve as roosting sites for local bats or as nesting sites for common urbanized birds such as barn owl (*Tyto*

alba), cliff swallow (*Petrochelidon pyrrhonota*), and rock pigeon. Common bats, such as the Mexican free-tailed bat (*Tadarida brasiliensis*), can adapt to living in urban areas near water. Bats will forage over brackish waterbodies, such as San Francisco Bay, especially in the shallows near shore, and may roost in structures that provide adequate thermal regulation.

Marine Communities

Intertidal habitat, subtidal habitat, and open water habitat comprise the marine communities within the marine study area identified during the marine resources reconnaissance survey on December 19, 2017.

Intertidal Habitat

Intertidal habitats, or the regions of the bay that lie between low and high tides, in the Central Bay include sandy beaches, natural and artificial rock (quarried rip rap), concrete bulkheads, concrete, composite and wood pier pilings and mud flats. These intertidal habitats provide highly diverse and varied locations for marine flora and fauna. The Central Bay's proximity to the Pacific Ocean has resulted in an intertidal zone inhabited by many coastal as well as estuarine species.

During the December 19, 2017 survey of the intertidal portions of the project site common algae species including sea lettuce (*Ulva* spp.) and rockweed (*Fucus gardeneri*) were observed along the shoreline. Other algae species not observed during the marine survey, but common to the Central Bay, include the red algae species (*Polyneura latissima* and *Gigartina* spp.) and the non-native brown algae species (*Sargossum muticum*).[20] Typically, sea lettuce dominates the high intertidal zone; sea lettuce, rockweed, and red algae dominates the middle intertidal zone; and brown algae dominates the low intertidal zone.[21]

Invertebrate taxa observed along the intertidal portions of the shoreline include balanoid barnacles (Balanidae) in the high and middle intertidal zones; limpets, *Mytilus* mussels, and scattered individual native Olympia oysters (*Ostrea lurida*) in the lower middle and low intertidal zones.

Spotted sandpiper (*Actitis macularius*) and black oystercatcher (*Haematopus bachmani*) may forage along the rocky shoreline during low tide within the intertidal zone of the marine study area.[22]

Subtidal Habitat

Central San Francisco Bay contains both soft sediment and hard substrate subtidal (below the low tide line) habitat. Soft bottom substrate ranges between soft mud with high silt and clay content and areas of coarser sand. These latter tend to occur in locations subjected to high tidal or current flow. Soft mud locations are typically located in areas of reduced energy that enable deposition of sediments that have been suspended in the water column, such as in protected slips, under wharfs, and behind breakwaters and groins.

[20] National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.
[21] Ibid.
[22] eBird: Warm Water Cove Park Hotspot, *https://ebird.org/hotspot/L1027305,* accessed January 19, 2018.

Hard substrate areas provide habitat for an assemblage of marine algae, invertebrates and fishes, similar to the hard substrate in the intertidal zone of the Central Bay. Submerged hard bottom substrate is typically covered with a mixture of turf organisms that is dominated by hydroids, bryozoans, tunicates, encrusting sponges, encrusting diatoms, and anemones. In the intertidal and near subtidal zones, the barnacles (*Balanus glandula*, *Amphibalanus amphitrite* and *A. improvisus*) are commonly present along with the Bay mussel, *Mytilus trossulus/galloprovincialis*, the invasive Asian mussel (*Musculista senhousia*), and Olympia oyster. Barnacles can also be found subtidally on pier pilings, exposed rock outcropping and debris.[23] At least six species of sponges, seven species of bryozoans, and the hydrozoans (*Ectopleura crocea*) and (*Garveia franciscana*) are found inhabiting both natural and man-made hard substrate.[24] Marine isopods and amphipods include the surface deposit feeders, algae grazers, and carnivores.[25]

In addition, three species of caprellids (i.e., detritivores, carnivores, and deposit feeders) are commonly observed only in the Central Bay.[26] Pacific rock crab (*Cancer antennarius*) and the red rock crab (*C. productus*) inhabit rocky, intertidal and subtidal areas in the Pacific Ocean, and likely use San Francisco Bay as an extension of their coastal habitats.[27] Adult (age 1+) Pacific rock crabs are most commonly found in Central Bay in both the fall and spring months. Juveniles are most common in the Central Bay from January to May and in South Bay from July to December.[28] Pacific rock crabs move seasonally from channels (January to April) to shoals (June to December).[29] The Pacific and red rock crabs are frequently the targets of sport anglers from piers and jetties.

The predominant seafloor habitat on the San Francisco waterfront, which includes the project site, is unconsolidated soft sediment composed of combinations of mud/silt/clay, however, in lesser quantities; portions of the substrate also include sand, and pebble/cobble, with varying amounts of intermixed shell fragments.[30] Exposure to wave and current action, temperature, salinity, and light penetration determine the composition and distribution of organisms within these soft sediments.[31] Based on many geologic and marine biological studies conducted within the Bay-Delta, unconsolidated sediments are present throughout the Bay-Delta and are the predominant substrate type.

The muddy-sand benthic community of the Central Bay consists of a diverse polychaete community represented by several subsurface deposit feeding capitellid species, a tube dwelling filter feeding species (*Euchone limnicola*), a carnivorous species (*Exogone lourei*), and the maldanid

23 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.
24 Ibid.
25 Ibid.
26 Ibid.
27 Hieb, K., Cancer Crabs. In: James J. Orsi, Report on the 1980-1995 Fish, Shrimp, and Crab Sampling in the San Francisco Estuary, California, 1999, *http://www.estuaryarchive.org/archive/orsi_1999*.
28 Ibid.
29 Ibid.
30 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.
31 Ibid.

polychaete *Sabaco elongatus*. There are also several surface deposit feeding *Ameana* spp. persisting throughout the year.[32]

The harbor and main channel areas of the Central Bay are characterized as a mix of the benthic communities from surrounding areas (deep and shallow-water and slough marine communities) and include the obligate amphipod filter-feeder *Ampelisca abdita* and the tube dwelling polychaete *Euchone limnicola*. As a result of increased water flow and sedimentation in the harbor areas of the Central Bay, the majority of the species reported inhabiting seafloor sediments in this region of the bay are deposit and filter feeders, including the amphipods *Grandidierella japonica*, *Monocorophium acherusicum*, and *Monocorophium alienense*, and the polychaetes *Streblospio benedicti* and *Pseudopolydora diopatra.* There is also a relatively high number of subsurface deposit feeding polychaetes and oligochaetes in these areas including *Tubificidae* spp., *Mediomastus* spp., *Heteromastus filiformis*, and *Sabaco elongatus*. There is also sufficient community complexity and abundance to support relatively high abundances of three carnivorous polychaete species: *Exogone lourei*, *Harmothoe imbricata*, and *Glycinde armigera*.

The most common large mobile benthic invertebrate organisms in the Central Bay include blackspotted shrimp (*Crangon nigromaculata*), the bay shrimp (*Crangon franciscorum*), Dungeness crab (*Metacarcinus magister*), and the slender rock crab (*Cancer gracilis*). Although other species of shrimp are present in the Central Bay, their numbers are substantially lower when compared to the number of bay and blackspotted shrimp present.[33] All of these mobile invertebrates are present throughout the Central Bay and provide an important food source for carnivorous fishes, marine mammals, and birds in San Francisco Bay's food web. Dungeness crabs use most of the bay as an area for juvenile growth and development prior to returning to the ocean as sexually mature adults.[34]

Because of the strong ocean influence in the Central Bay, additional species of red and brown algae are found attached to submerged intertidal hard substrate, including pier pilings. These include *Cladophora sericea, Codium fragile, Fucus gardneri, Laminaria sinclairii, Egregia, Halymenia schizymenioides menziesii, Sargassum muticum, Polyneura latissima, Cryptopleura violacea, and Gelidium coulteri.*[35] In addition, the species *Codium fragile* subspecies *tomentosoides, Bryopsis hypnoides*, *Chondracanthus exaspertatus,* and *Ahnfeltiopsis leptophyllus* can be found inhabiting either hard or soft substrate.[36] Based on regional surveys performed in the San Francisco Bay from 2003 to 2014, no eelgrass (*Zostera marina*) beds are documented or known to occur within the project's marine

32 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.
33 Ibid.
34 Tasto, R. N., "San Francisco Bay: Critical to the Dungeness Crab?" In: T. J. Conomos, editor, San Francisco Bay: The Urbanized Estuary, 1979, Pacific Div Am Ass Adv Sci, San Francisco, California: 479-490.
35 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.
36 Ibid.

study area.[37] All submerged aquatic vegetation in the Central Bay is considered critical essential fish spawning habitat for Pacific herring.[38]

Open Water (Pelagic) Habitat

Because of its close proximity to the Pacific Ocean, the open water (pelagic zone) environment of the Central Bay is very similar to the open water coastal environment. Pelagic habitat is the predominant marine habitat in Central San Francisco Bay and includes the area between the water surface and the seafloor. The water column can be further subdivided into shallow-water/shoal and deepwater/channel areas.[39] The pelagic water column habitat is predominantly inhabited by planktonic organisms that either float or swim in the water, fish, marine birds, and marine mammals.

Marine Birds

Typical marine birds regularly inhabiting or using the open waters of the study area include double-crested and Brandt's cormorants (*Phalacrocorax auritus* and *P. penicillatus*), pigeon guillemot (*Cepphus columba*), herring gull (*Larus argentatus*), mew gull (*L. canus*), Western gull (*L. occidentalis*), California gull (*L. californicus*), ring-billed gull (*L. delawarensis*), eared grebe (*Podiceps nigricollis*), western and Clark's grebe (*Aechmophorus occidentalis* and *A. clarkii*), common loon (*Gavia immer*), Caspian tern (*Hydroprogne caspia*), least tern (*Sternula antillarum*), and California brown pelican (*Pelecanus occidentalis californicus*). Among the diving benthivores guild, canvasback (*Aythya valisineria*), greater scaup (*A. marila*), lesser scaup (*A. affinis*), and surf scooter (*Melanitta perspicillata*) are common.

Marine Mammals

Few species of marine mammals are found within the San Francisco Bay; only Pacific harbor seals (*Phoca vitulina richardsi*), California sea lions (*Zalophus californianus*), and harbor porpoises (*Phocoena phocoena*) are sighted year-round and have potential to occur in the project study area. Most cetacean sightings tend to occur in the Central Bay (the area bound by the Golden Gate Bridge, the San Francisco – Oakland Bay Bridge, and Richmond Bridge), outside of the project study area.

In general, the presence of marine mammals in the San Francisco Bay is related to distribution and presence of prey species and foraging habitat. Additionally, harbor seals and sea lions use various intertidal substrates that are exposed at low to medium tide levels for resting and breeding.[40] California sea lions are noted for using anthropogenic structures such as floating docks, piers, and buoys to haul out of the water to rest. Marine mammal haul out locations do not occur in the project study area. As such, the presence of marine mammals within the project study area is likely to be confined to a few individuals possibly rafting or foraging off-shore, and not the large numbers or breeding colonies seen elsewhere within the San Francisco Bay.

---

37 Merkel & Associates, San Francisco Bay Eelgrass Inventory; October-November 2014, prepared for the California Department of Transportation and NOAA National Marine Fisheries Service, November 2014.

38 The Magnuson-Stevens Act defines "essential fish habitat" as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

39 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, June 2007.

40 Ibid.

Sensitive Natural Communities

A sensitive natural community is a biological community that is regionally rare, provides important habitat opportunities for wildlife, is structurally complex, or is in other ways of special concern to local, state, or federal agencies. The California Department of Fish and Wildlife Natural Diversity Database reports no sensitive natural community occurrences within the San Francisco North and South U.S. Geological Survey 7.5-minute topographic quadrangles including and surrounding the terrestrial study area.[41] In addition, no sensitive natural communities were identified on the project site during the biological field reconnaissance survey.

Wetlands and Other Jurisdictional Waters

San Francisco Bay

No wetlands occur in either the marine or terrestrial project study areas; however, the project site is adjacent to the San Francisco Bay, which the U.S. Army Corps of Engineers classifies as navigable "waters of the U.S." Navigable waters of the U.S. refer to non-wetland aquatic features (other waters) which are regulated by the Federal Clean Water Act. *Waters of the State* of California are defined as "any surface water or groundwater, including saline waters, within the boundaries of the State" (California Water Code section 13050[e]) and include all federally jurisdictional waters.

As navigable waters of the U.S., the San Francisco Bay is regulated by the U.S. Army Corps of Engineers under section 10 of the Rivers and Harbors Act up to mean high water mark, and under section 404 of the Clean Water Act up to the high tide line. These waters are also regulated by the Regional Water Quality Control Board as Waters of the State. In addition, the San Francisco Bay Conservation and Development Commission regulates the fill, extraction of materials, and substantial changes in use of land, water, and structures within the bay and within 100 feet of the bay shoreline (100 feet inland of the mean high water mark), which includes some of the terrestrial or landside portions of the project site. See "Regulatory Framework," beginning on p. 4.I-24, for additional discussion of federal and state waters, and jurisdiction over San Francisco Bay and near-shore areas.

Wildlife Movement Corridors

The project site is not part of an established terrestrial wildlife movement corridor because it does not provide a connection between different habitat areas; rather, project site conditions are consistent with surrounding industrial use areas within the terrestrial study area that provide the same or similar habitat opportunity for local wildlife. Migrating birds that forage in intertidal and marine environments may use the San Francisco Bay during migration; however, because the terrestrial study area and reinforced shoreline are developed or highly disturbed, they do not offer high-quality habitat for migrating birds.

[41] CDFW, California Natural Diversity Database (CNDDB) Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, accessed August 13, 2018.

Special-Status and Otherwise Protected Species

A number of species known to occur in either the marine or terrestrial study areas are protected pursuant to federal and/or state endangered species laws, have been designated as species of special concern by federal and/or state agencies, or are afforded certain protection through regulatory means such as by California Fish and Game Code. Species recognized under these terms are collectively referred to as *special-status species*. For the purpose of this EIR, special-status species include the following:

1. Species listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 Code of Federal Regulations 17.12 [listed plants], 17.11 [listed animals], and various notices in the Federal Register [proposed species]).

2. Species that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (61 Code of Federal Regulations 40, February 28, 1996).

3. Species of *special concern*, as designated by U.S. Fish and Wildlife Service or National Marin Fisheries Service.

4. Species listed or proposed for listing by the state as threatened or endangered under the California Endangered Species Act (14 California Code of Regulations 670.5).

5. Species described by the California Department of Fish and Wildlife as species of special concern.[42]

6. Species designated as fully protected by the state (there are about 37, most of which are also listed as either endangered or threatened).

7. Raptors (birds of prey), which are specifically protected by California Fish and Game Code section 3503.5, thus prohibiting the take, possession, or killing of raptors and owls, their nests, and their eggs.[43]

8. Plants listed as rare or endangered under the California Native Plant Protection Act (California Fish and Game Code, section 1900 et seq.).

9. Species that meet the definitions of rare and endangered under CEQA. CEQA section 15380 provides that a plant or animal species may be treated as "rare or endangered" even if not on one of the official lists (CEQA Guidelines, section 15380).

10. Plants considered to be "rare, threatened or endangered in California" under the California Rare Plant Ranking system, which includes Rank 1A, 1B, 2A, and 2B plant species.[44]

---

42 A California species of special concern is one that has been extirpated from the state; meets the state definition of threatened or endangered but has not been formally listed; is undergoing or has experienced serious population declines or range restrictions that put it at risk of becoming threatened or endangered; and/or has naturally small populations susceptible to high risk from any factor that could lead to declines that would qualify it for threatened or endangered status.

43 The inclusion of birds protected by Fish and Game Code section 3503.5 is in recognition of the fact that these birds are substantially less common in California than most other birds, having lost much of their habitat to development, and that the populations of these species are therefore substantially more vulnerable to further loss of habitat and to interference with nesting and breeding than most other birds. It is noted that a number of raptors and owls are already specifically listed as threatened or endangered by state and federal wildlife authorities.

44 California Rare Plant Ranking system rankings are defined in detail in Regulatory Framework.

Lists of special-status plant and animal species assessed for their potential to occur within the study area for terrestrial biological resources were compiled based on data contained in the California Department of Fish and Wildlife Natural Diversity Database[45] and the California Native Plant Society Inventory of Rare and Endangered Plants[46] for the San Francisco North and South USGS 7.5-minute topographical quadrangles, U.S. Fish and Wildlife Service Official Species List and CalIPaC Trust Report,[47] and the list of locally significant plants for San Francisco County.[48] Marine special-status species were compiled from the fish and wildlife service, marine fisheries service, and the department of fish and wildlife listings, Federal Register notifications, and assorted published and non-published literature relevant to the marine study area of the Central Bay basin. Several additional species were identified based on the findings of technical reports and environmental literature. Lists for terrestrial and marine species that may occur in the project study areas are addressed separately. Three tables in Appendix G (Table BIO-1: Special-Status or Otherwise Protected Plant Species that May Occur in the Study Area, Table BIO-2: Special-Status or Otherwise Protected Terrestrial Animal Species that May Occur in the Study Area, and Table BIO-3: Special-Status Fish and Marine Mammals that May Occur within the Bay Waters of the Study Area) present the special-status species considered in the analysis, including each species' legal or protective status, habitat requirements, and blooming period (for plants), and the potential for occurrence within either the terrestrial or marine project study areas. Figure BIO-1 in Appendix G identifies the locations of regional special-status species occurrences as reported in the natural diversity database within 5 miles of the project site.

The tables in Appendix G indicate the likelihood of occurrence of each identified species based on a review of the biological literature of the region, information presented in previous environmental documentation, and an evaluation of the habitat conditions within the study area. A species was designated to have "no potential" to occur if (1) its specific habitat requirements (e.g., serpentine grasslands, as opposed to grasslands occurring on other soils) are not present; or (2) it is presumed to be extirpated from the area or region based on the best scientific information available. A species was designated as having a "low" potential for occurrence if (1) its known current distribution or range is outside of the study area; or (2) only limited or marginally suitable habitat is present within the study area. A species was designated as having a "moderate" potential for occurrence if (1) there is low to moderate quality habitat present within the study area or immediately adjacent areas; and (2) the study area is within the known range of the species, even though the species was not observed during biological surveys. A species was designated as having a "high" potential for occurrence if (1) moderate to high quality habitat is present within the study area; and (2) the study

45 CDFW, CNDDB Rarefind version 5 query of the San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, Commercial Version, accessed August 13, 2018.

46 California Native Plant Society (CNPS), Inventory of Rare and Endangered Plants for San Francisco North and San Francisco South USGS 7.5-minute topographic quadrangles, *http://www.rareplants.cnps.org/result.html?adv=&quad=3712264:3712274*, accessed August 13, 2018.

47 U.S. Fish and Wildlife Service (USFWS), My Project, IPaC Trust Resource Report and Official Species List of Federally Endangered and Threatened Species that may occur in the Potrero Power Station Mixed-Use Development Project location, and/or may be affected by the proposed project, August 13, 2018.

48 Wood Biological, Locally Significant Plant Species of San Francisco County, prepared by Mike Wood, July 4, 2015, *http://cnps-yerbabuena.org/wp-content/uploads/SF-locally-significant-plants_2015-07-04_sorted-alphabetically.pdf*, accessed February 20, 2018.

area is within the known range of the species. A species was designated as "present" if it was observed within the project site during reconnaissance or focused surveys.

Special-Status and Otherwise Protected Plants

The special-status or otherwise protected plant species identified in Appendix G, Table BIO-1 are considered to have either no potential to occur in the terrestrial study area or a low potential to occur in the terrestrial study area due to the heavily disturbed or developed nature of the project site and corresponding absence of suitable habitat for rare species. Due to existing development, no potential habitat that could support special-status plant species was observed during the December 19, 2017, terrestrial biological resources reconnaissance survey of the project site. No special-status plants are expected within the terrestrial study area and they are, therefore, not considered further in this analysis.

Special-Status and Otherwise Protected Terrestrial Animals

Many of the special-status terrestrial animals identified in Appendix G, Table BIO-2 have no potential to occur in the terrestrial study area or a low potential to occur in the terrestrial study area due to the absence of suitable habitat that is required by the animal species or necessary for their survival. Double-crested cormorant, a California species of special concern, was observed in the San Francisco Bay during the biological resources reconnaissance survey conducted December 19, 2017, and other special-status bird and bat species have the potential to occur in the terrestrial study area. While several special-status bird species may occur in the terrestrial and marine project study areas, particularly in a foraging capacity, nesting habitat for these species is mostly absent from the developed project site due to a lack of necessary ecological components. For example, Clark's grebe will overwinter in the San Francisco Bay but leave to breed and nest at inland freshwater lakes and marshes with dense border vegetation. Vegetation of the project site that could support nesting birds includes trees along Illinois and 22nd streets, ruderal grasses along the shoreline riprap, and coyote bush, sweet fennel, and pampas grass located in the southeast corner of the project site, which would become Potrero Point Park. This vegetation provides some nesting substrate for birds but is generally meager and relatively isolated among the otherwise developed terrestrial study area. This built environment, however, can be attractive to some nesting birds that form scrape nests on rooftops, build mud nests in building eaves, or stick nests on building supports. Only those special-status species known to occur within the study area or considered to have at least a moderate potential to occur in the study area were considered in the impact analysis; these species are described below.

Specific individuals in the following groups of terrestrial special-status animals have at least a moderate potential to occur in the terrestrial study area:

- Special-Status Birds
- Other Resident and Migratory Birds
- Special-Status Bats

Special-Status Birds

Special-status birds that have at least a moderate potential to occur onsite are discussed below.

American Peregrine Falcon

The American peregrine falcon (*Falco peregrines anatum*) is a California fully protected species that is regularly observed in the study area, though more frequently observed south of Pier 80.[49] The American peregrine falcon nests on cliff ledges in natural environments, but it has adapted to nesting on shelves of tall buildings or structures in urban environments.[50] The Santa Cruz Predatory Research Group has been closely following a successful breeding pair of peregrines that have nested at the Pacific Gas and Electric Company (PG&E) building on Beale Street from 2005 to 2014. This raptor commonly hunts other birds in flight from perches or from high in the air. Although peregrines typically prefer to nest in taller buildings than those on the project site, it is possible that they could nest in one of the existing multi-story buildings on the project site such as Station A or the Unit 3 Power Block in the present condition. American peregrine falcon nesting has not been documented on the project site or within the study area, though they may use the study area to forage, as rock pigeons appear to roost within buildings of Station A year-round and provide a food source for this species.

California Gull

The California gull is on the California Department of Fish and Wildlife Watch List and nesting colonies in California are still considered to be of conservation concern even though the species has established large breeding colonies in the San Francisco Bay Area.[51] The California gull is a medium-sized gull with a yellow bill with a black ring, and yellow legs. The species breeds primarily at lakes and marshes in interior western North America from Canada south to eastern California and Colorado.[52] Birds that breed inland are migratory, most moving to the Pacific coast in the winter. More recently, the species has been breeding in large numbers at the salt ponds of southern San Francisco Bay. They nest in colonies, sometimes with other bird species. The nest is a shallow depression on the ground lined with vegetation and feathers. The female usually lays two or three eggs, and both parents feed the young birds. California gulls forage in flight or pick up objects while swimming, walking, or wading and primarily eat insects, fish, and eggs. They also scavenge at garbage dumps and docks. While California gulls forage in the San Francisco Bay, they are unlikely to nest in the study area or on the project site in its present condition due to the absence of suitable nesting habitat on the project site, and the lack of historical nesting in the study area.

---

49 eBird, Peregrine falcon Range Map, San Francisco hotspots, *https://ebird.org/map/perfal?neg=true&env.minX=&env.minY=&env.maxX=&env.maxY=&zh=false&gp=false&ev=Z&mr=1-12&bmo=1&emo=12&yr=all&byr=1900&eyr=2018*, accessed February 20, 2018.

50 Sibley, David A., The Sibley Guide to Bird Life and Behavior, National Audubon Society, Alfred A. Knopf, New York, 2001, p. 106.

51 Ackerman, J.T., J.Y. Takekawa, C. Strong, N. Athearn, and A. Rex, California Gull Distribution, Abundance, and Predation on Waterbird Eggs and Chicks in South San Francisco Bay, Final Report, U.S. Geological Survey, Western Ecological Research Center, Davis and Vallejo, California, 2006, p. 61.

52 Sibley, David A., The Sibley Guide to Birds. National Audubon Society, Alfred A. Knopf, New York, 2003, p. 215.

Osprey

The osprey (*Pandion haliaetus*) is a former California species of special concern, and nesting osprey are on the California Department of Fish and Wildlife Watch List. Osprey are also protected under section 3503.5 of the California Fish and Game Code. These large fish-eating raptors can be found around nearly any water body, including salt marshes, rivers, ponds, reservoirs, estuaries, and oceans. Historically, ospreys nested throughout much of California, but by the 1960s much of the osprey population declined in the central and southern California areas. This decline was attributed to harassment, habitat alteration, and *DDT*[53] use. The osprey prefers to nest within sight of permanent water and readily builds its nest on human-made structures, such as telephone poles, channel markers, duck blinds, and elevated nest platforms designed especially for it. A nesting pair bred successfully on top of a crane located at Pier 80 in 2012, south of the project site.[54] Marginal nesting structures for osprey occur within the project site (e.g., the Unit 3 Power Block) and surrounding study area, and foraging habitat is present within the San Francisco Bay; however, nesting has not been documented onsite.

California Brown Pelican

A State Fully Protected Species, brown pelicans occur in estuarine, marine subtidal, and marine pelagic waters throughout coastal California.[55] Important habitat for pelicans during the nonbreeding season includes roosting and resting areas, such as offshore rocks, islands, sandbars, breakwaters, and pilings. Suitable areas need to be free of disturbances, including regular human activity. This species rests temporarily on the water or isolated rocks, but roosting requires a dry location near food and a buffer from predators and humans. The California brown pelican is a common post-breeding resident (May through November) of the open waters of central San Francisco Bay. Nesting habitat does not occur on the project site; San Francisco Bay is located outside of the species' breeding range, which is limited to the Channel Islands south to central Mexico. Brown pelican presence within or near the project site would be limited to loafing on dilapidated piers or bulkheads and foraging in the bay and adjacent environs.

Double-Crested Cormorant

The double-crested cormorant is a Species of Special Concern in California. A year-round resident along the entire coast of California, the species is common along the coast and in estuaries and salt ponds. They forage mainly on fish, crustaceans, and amphibians. These birds sometimes feed cooperatively in flocks of up to 600, often with pelicans, and nest in colonies of a few to hundreds of pairs.[56] There are breeding colonies on Alcatraz, the Richmond-San Rafael Bridge, electrical

---

53 DDT, or dichloro-diphenyl-trichloroethane was developed as the first of the modern synthetic insecticides in the 1940s. It was initially used with great effect to combat malaria, typhus, and the other insect-borne human diseases among both military and civilian populations. It also was effective for insect control in crop and livestock production, institutions, homes, and gardens.

54 Golden Gate Audubon Society, Osprey Chick Hatches on Top of Maritime Crane in San Francisco's First Documented Osprey Birth, press release, July 1, 2012.

55 Zeiner D.C., W.F. Laudenslayer, Jr., K.E. Mayer, M. White, California's Wildlife Volume II, Birds, California Department of Fish and Game, California brown pelican, 1990.

56 Ibid.

towers of the South Bay, and the eastern span of the Bay Bridge.[57,58] This species forages in the San Francisco Bay and is regularly observed offshore of the project site. Although unlikely, the species has the potential to nest on the dilapidated piers within the project study area.

Caspian Tern

Caspian tern is considered a Bird of Conservation Concern by the U.S. Fish and Wildlife Service, and its nesting areas are protected. This species is common along the California coast and at scattered locations inland. It nests in colonies from April through early August on sandy estuarine shores, on levees in salt ponds, and on islands in alkali and freshwater lakes. Breeding adults often fly substantial distances to forage in *lacustrine*,[59] riverine, and fresh and saline emergent wetland habitats. They have successfully nested at Piers 60 and 64, north of the project site; however, nesting has not been documented or observed on the project site.[60]

Black Oystercatcher

Black oystercatcher is considered a Bird of Conservation Concern by the U.S. Fish and Wildlife Service. This species inhabits rocky shoes and islands along the Pacific coast from the Aleutian Islands to Baja California. Black oystercatchers feed on marine invertebrates, especially mussels, worms, echinoderms, crustaceans, barnacles, and limpets, and sometimes fish.[61] Pairs develop long-term bonds and feeding territories are defended year-round. Nests are typically located above the high tide line and consist of a slight depression lined with rock or shell bits.[62] This species has been documented in the project study area south of the project site in Warm Water Cove.[63] Individuals may forage among the riprap along the eastern shoreline of the project site though are unlikely to nest in the project study area. Nesting has not previously been documented on eastern shoreline of San Francisco.

Clark's grebe

Clark's grebe is considered a Bird of Conservation Concern by the U.S. Fish and Wildlife Service. This species winters in coastal saltwater and brackish water estuaries and is commonly observed communing in large rafts within San Francisco Bay. Clark's grebes forage marine insects, invertebrates, fish and amphibians.[64] They engage in extensive courtship displays prior to breeding which occurs in freshwater lakes and ponds with ample perimeter marsh vegetation. Nests are

57 Cabanatuan, M., Bay Bridge bird colony settles in on new span, San Francisco Chronicle, May 20, 2017, *https://www.sfchronicle.com/bayarea/article/Bay-Bridge-bird-colony-settles-in-on-new-span-11160676.php*, accessed May 17, 2018.

58 Davis, C., The Double-crested Cormorant: Bad Rap for this Local Come-back Kid, San Francisco Bay National Wildlife Refuge Complex, Tideline Vol. 30, No.4, Winter 2009, *https://www.fws.gov/uploadedFiles/Region_8//_2/San_Francisco_Bay_Complex/tideline%20winter%2009.pdf*, accessed May 17, 2009.

59 Habitat surrounding inland depressions or dammed riverine channels containing standing water (i.e. a lake).

60 Golden Gate Audubon Society and San Francisco Bay Bird Observatory, Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties, prepared by Noreen Weeden and Michael Lynes, September 23, 2009.

61 Ehrlich, P.R., D.S. Dobkin, and O. Wheye, The Birder's Handbook: A Field Guide to the Natural History of North American Birds, Simon and Schuster, New York, NY, 1988, p. 106.

62 Ibid.

63 eBird: Warm Water Cove Park Hotspot, *https://ebird.org/hotspot/L1027305,* accessed January 19, 2018.

64 Ehrlich, P.R., D.S. Dobkin, and O. Wheye, The Birder's Handbook: A Field Guide to the Natural History of North American Birds, Simon and Schuster, New York, NY, 1988, p. 8.

built on anchored, vegetative rafts in shallow water. Overwintering Clark's grebe are known to forage offshore from the project site.

Other Resident and Migratory Birds

Although many native birds are not considered to be special-status species, their nests are protected by the Migratory Bird Treaty Act and the California Fish and Game Code. Many resident and migratory birds could nest in existing street trees and ruderal vegetation in the portion of the Port Sub-area at the end of 23rd Street (the area of the future Potrero Point Park) or in existing buildings within the study area. Cliff swallow, barn swallow (*Hirundo rustica*), and black phoebe (*Sayornis nigricans*) could build mud nests on the outside of existing buildings and barn owls may nest inside of existing buildings at the project site. Western gull (*Larus occidentalis*) could nest on building roofs or dilapidated piers within the study area and nesting has been previously documented at Pier 60 and 64, north of the project site.[65] Other passerine species, such as house finch, Allen's hummingbird (*Selasphorus sasin*), and Anna's hummingbird, could build nests in fennel shrubs or other woody vegetation within the park, while killdeer (*Charadrius vociferous*) and mourning dove build nests on the ground. Great blue heron (*Ardea Herodias*), black oyster catcher, and spotted sandpiper could also forage within the exposed intertidal shoreline along the eastern boundary of the site; however, nesting habitat for these species does not occur in the project study area.

Special-Status Bats

Two special-status bat species have a moderate potential to roost within the project study area: Pallid bat (*Antrozous pallidus*), considered a California Species of Special Concern by the California Department of Fish and Wildlife, and Yuma myotis (*Myotis yumanensis*), considered a California special animal by the department. Suitable roosting habitat for these bats within the project site primarily includes open spaces, cracks, and crevices within existing buildings, though these species are also known to roost in tree foliage, beneath the exfoliating bark of trees, and in tree cavities. Of the existing buildings and structures on the project site, Station A (buildings 15, 16, and 17; see Chapter 2, Project Description, Figure 2-3) is especially suitable for bat roosts due to the lack of a roof, numerous other entry points into the large and vacant building, and multiple stories and interior rooms with abandoned electrical control equipment and storage areas which provide surfaces and sheltered substrate to establish roosts. The Unit 3 Power Block (buildings 22, 23, 24, and 25 on Figure 2-3) also provides roost habitat, particularly within the Boiler Stack (the Stack).

Bat surveys conducted in 2009 of San Francisco's parks and natural areas found that the three most commonly encountered species in the area are Mexican free-tailed bat (*Tadarida brasiliensis*), Yuma myotis, and western red bat (*Lasiurus blossevillii*).[66] Mexican free-tailed bats, which have no special status, were widespread and abundant throughout the sampled natural areas and the only species documented near the project site were at Buena Vista Park (approximately 2 miles southwest) and

[65] Golden Gate Audubon Society and San Francisco Bay Bird Observatory, Summary Report of Avian Surveys Conducted in 2008 at Dilapidated Piers and Other Structures along the Port of San Francisco's Southern Waterfront Properties, prepared by Noreen Weeden and Michael Lynes, September 23, 2009.

[66] Krauel, J.K., Foraging Ecology of Bats in San Francisco, M.S. Thesis, San Francisco State University, San Francisco, California, August 2009.

at Bayview Park (approximately 3 miles south).[67] Yuma myotis and western red bat were much less abundant and generally were restricted to parks with lakes. Suitable roosting habitat for Pallid bat and Yuma myotis, and the common Mexican free-tailed bat is present in unoccupied buildings within the project study area.

Special-Status Fish and Marine Mammals

Specific individuals in the following groups of marine special-status animals have at least a moderate potential to occur in the marine study area:

- Special-Status Fish
- Special-Status Marine Mammals
- Managed U.S. Fisheries Species
- Other Special-Status Marine Species

Special-Status Fish

Chinook salmon

The Chinook salmon (*Oncorhynchus tshawytscha*) that inhabit the San Francisco Bay are comprised of three distinct races: winter-run, spring-run, and fall/late fall-run.[68] These races are distinguished by the seasonal differences in adult upstream migration, spawning, and juvenile downstream migration. Chinook salmon are anadromous fish, spending three to five years at sea before returning to fresh water to spawn. These fish pass through San Francisco Bay waters to reach their upstream spawning grounds. In addition, juvenile salmon migrate through the bay en route to the Pacific Ocean.

Sacramento River winter-run Chinook salmon, listed as endangered under the federal and state endangered species acts, migrate through the San Francisco Bay from December through July with a peak in March.[69] Central Valley spring-run Chinook, listed as threatened under the federal and state endangered species acts, migrate to the Sacramento River from March to September with a peak spawning period between late August and October.[70] The Central Valley fall/late fall-run Chinook salmon is a California species of special concern.

While all three chinook salmon races are found in the San Francisco Bay, the Central Valley fall/late fall-run are the only race that spawns in San Francisco Bay tributary streams. However, most stream habitat in the San Francisco Bay lacks the necessary flow regime, habitat availability, and/or water quality to support spawning salmonids. Additionally, individuals are rarely documented within the project study area or the immediate vicinity; and any occurrence would only be temporary as the surrounding bay habitat is primarily used as a migration corridor between the Pacific Ocean and spawning habitat in the Central Valley.[71]

---

67 Krauel, J.K., Foraging Ecology of Bats in San Francisco, M.S. Thesis, San Francisco State University, San Francisco, California, August 2009.
68 These races are referred to as Evolutionarily Significant Units.
69 Moyle, P.B., Inland Fishes of California, University of California Press, Berkeley and Los Angeles, CA, 2002.
70 Ibid.
71 Interagency Ecological Program for the San Francisco Bay Estuary (IEP); San Francisco Bay Study, 2010-2014, Unpublished Raw Mid-water and Otter Trawl Data, 2014.

Steelhead

Similar to Chinook salmon, steelhead (*O. mykiss*) within California are subdivided into Distinct Population Segments based on their life history. Within the Central San Francisco Bay, both the federally threatened Central California Coast and federally threatened California Central Valley steelhead may use the channel habitat adjacent to the project study area as a migratory corridor from the Pacific Ocean to spawning habitat.

While Central California Coast steelhead are known to occur within multiple Central San Francisco Bay streams, none are in proximity to the project study area. The nearest watershed that supports Central California Coast steelhead is the San Mateo Creek watershed which empties into San Francisco Bay approximately 10 miles south of the project study area.[72] As such, any occurrence of Central California Coast steelhead within the project study area would be temporary, and only occur as steelhead move through the open water habitat adjacent to the project site during migration between the Pacific Ocean and freshwater spawning grounds.

Green sturgeon

The federally threatened, southern Distinct Population Segments of North American green sturgeon (*Acipenser medirostris*) are the most widely distributed member of the sturgeon family and the most marine-oriented of the sturgeon species, entering rivers only to spawn. Within bays and estuaries, sufficient water flow is required to allow adults to successfully orient to the incoming flow and migrate upstream to spawning grounds. Green sturgeon migrating between the Pacific Ocean and spawning habitat in the Sacramento River watershed rarely travel south of the San Francisco Bay Bridge. Typically, adults take a more direct route from San Pablo Bay, passing through Raccoon Strait adjacent to Angel Island, and out the Golden Gate Bridge.[73] So while sturgeon do have the potential to temporarily occur year-round within the project area, their preferred migration routes suggest a low-likelihood for presence. However, green sturgeon have the potential to be present throughout all marine portions of the project area at any time of the year.

Longfin smelt

The longfin smelt (*Spirinchus thaleichthys*) is a small, slender-bodied pelagic fish listed as threatened under the California Endangered Species Act and are a candidate for listing under the Federal Endangered Species Act. Longfin smelt are most likely to occur within the Central San Francisco Bay during the late summer months before migrating upstream in fall and winter. During winter months, when fish are moving upstream to spawn, high outflows may push many fish back into the San Francisco Bay.[74]

---

72 Leidy, R.A., G.S. Becker, B.N. Harvey, Historical distribution and current status of steelhead/rainbow trout (Oncorhynchus mykiss) in streams of the San Francisco Estuary, California, Center for Ecosystem Management and Restoration, Oakland, CA, 2005.

73 Kelly, J.T, A.P Klimley, and C.E. Crocker, Movements of green sturgeon, Acipenser medirostris, in the San Francisco Bay Estuary, Environmental Biology of Fishes, 2007, 79:281-295.

74 Moyle, P.B., Inland Fishes of California, University of California Press, Berkeley and Los Angeles, CA, 2002.

Pacific herring

Pacific herring (*Clupea pallasii*) are a California Department of Fish and Wildlife managed species and are protected within the San Francisco Bay under the Marine Life Management Act which provides guidance, in the form of Fisheries Management Plans, for the sustainable management of California's historic fisheries. The department, in partnership with the fishing industry and conservation groups, is currently updating the Pacific Herring Fisheries Management Plan, which will formalize a strategy for the future management of the fishery.

The Pacific herring is a small schooling marine fish that enters estuaries and bays to spawn. This species is known to spawn along the Oakland and San Francisco waterfronts and attach its egg masses to eelgrass, seaweed, and hard substrates such as pilings, breakwater rubble, and other hard surfaces. An individual can spawn only once during the season, and the spent female returns to the ocean immediately after spawning. Spawning usually takes place between October and March with a peak between December and February. After hatching, juvenile herring typically congregate in the San Francisco Bay during the summer and move into deeper waters in the fall. The waterfront adjacent to the project study area has been identified as a herring spawning location. However, no suitable spawning habitat is present within the footprint of the proposed in-water construction. The department has historically reported herring spawning within the vicinity of the project study area. During the 2015-2016 season, spawning was observed at multiple locations between the San Francisco Bay Bridge and Islais Creek.[75] However, no spawning in these locations was observed during the 2016-2017 spawning season.[76] In-water construction activities (i.e., dredging and pile installation) would be restricted to the National Oceanic and Atmospheric Administration approved seasonal work window (June 1 to November 30), which encompasses the California Department of Fish and Wildlife seasonal work window for Pacific herring.

Special-Status Marine Mammals

Pacific harbor seal

Pacific harbor seal (*Phoca vitulina richardsi*) is a permanent resident in the San Francisco Bay and is routinely seen in waters near the project site. Harbor seals are protected under the Marine Mammal Protection Act. They have been observed as far upstream in the Delta and Sacramento River as the City of Sacramento, though their use of the habitat north of Suisun Bay is irregular.[77]

The closest location to the project site where harbor seals are known to haul out year-round is on the southeast side of Yerba Buena Island, on U.S. Coast Guard property. Individual seals may occasionally haul out farther to the west and southwest of the main haul out site, depending on space availability and conditions at the main haul out area. Harbor seals feed in the deepest waters

[75] CDFW, Summary of the 2015-2016 Pacific Herring Spawning Population and Commercial Fisheries in San Francisco Bay, November 2016.
[76] Ibid.
[77] Goals Project, Baylands Ecosystem Species and Community ProfilesL Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. P.R. Olofson, ed. San Francisco Bay Regional Water Quality Control Board, Oakland, California, 2000.

of the bay, with the region from the Golden Gate Bridge to Treasure Island and south to the San Mateo Bridge, being the principal feeding sites.[78] Harbor seals feed on a variety of fish, such as perch, gobies, herring, and sculpin.

California sea lion

Like the harbor seal, the California sea lion (*Zalophus californianus*) lives in the San Francisco Bay-Delta and is protected by the Marine Mammal Protection Act. A common, abundant marine mammal, they are found throughout the West Coast, generally within 10 miles of shore. They breed in Southern California and the Channel Islands, after which they migrate up the Pacific coast to the bay. They haul out on offshore rocks, sandy beaches, and onto floating docks, wharfs, vessels, and other man-made structures in the bay and coastal waters. California sea lions feed on a wide variety of seafood, mainly squid and fish and sometimes even clams. Commonly eaten fish and squid species include salmon, hake, Pacific whiting, anchovies, herring, schooling fish, rockfish, lamprey, dog fish, and market squid.[79] California sea lions may forage in the waters adjacent to the project site.

Harbor porpoise

Harbor porpoise (*Phocoena phocoena*) inhabit northern temperate and subarctic coastal and offshore waters. In the North Pacific, they are found from Japan north to the Chukchi Sea and from Monterey Bay, California to the Beaufort Sea. They are most often observed in bays, estuaries, harbors, and fjords less than 650 feet deep, like the Central San Francisco Bay and the waters adjacent to the project site. The primary food for harbor porpoises is fish and squid.

Managed U.S. Fisheries Species

Under the Magnuson-Stevens Act (see Regulatory Framework, p. 4.I-24, for a description), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-297), National Marine Fisheries Service, Fishery Management Councils, and federal agencies are required to cooperatively protect essential fish habitat for commercially important fish species such as Pacific coast groundfish, salmon, and coastal pelagic fish and squid. As defined by the U.S. Congress, essential fish habitat includes "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." Fish species present in the Central Bay basin that are included in Fishery Management Plans prepared by regional Fishery Management Councils under the Magnuson-Stevens Act are listed in Appendix G, Table BIO-3.

[78] Kopec, D. and Harvey, J., Toxic pollutants, health indices, and population dynamics of harbor seals in San Francisco Bay, 1989-91: a final report, technical publication, Moss Landing, CA: Moss Landing Marine Labs, 1995.

[79] Southwest Fisheries Science Center, "Sea Lion Diet", *https://swfsc.noaa.gov/textblock.aspx?Division=PRD&=&id=1252,* accessed March 18, 2011.

Other Special-Status Marine Species

Native Olympia Oysters

The Olympia oyster (*Ostrea lurida*), also known as the "native oyster," is native to most of western North America, and it was a key component of the San Francisco Bay marine ecosystem prior to overharvesting and increased siltation from hydraulic mining in the mid-nineteenth century.[80] Thought to have gone extinct in San Francisco Bay, Olympia oysters have been observed slowly reestablishing their presence in the San Francisco Bay since 2000. Because of its special importance as a keystone species in the Bay, the restoration and reestablishment of Olympia oysters in the San Francisco Bay has become an important component of the overall resource management and restoration of the San Francisco Bay by the National Marine Fisheries Service and California Department of Fish and Wildlife.[81]

In their natural state, Olympia oysters form sparse to dense beds in coastal bays and estuaries and in drought conditions will move up into channels and sloughs, dying off when wetter conditions return. Olympia oysters are not reef builders like their East and Gulf Coast cousin, *Crassostrea virginica*. Olympia oysters are known to provide high biodiversity habitat because they provide physical habitat structure sought by juvenile fish and crustaceans, worms, and foraging fish and birds.[82] They also stabilize sediment, reduce suspended sediment, and improve light penetrations, thereby improving the physical conditions that encourage the establishment of submerged aquatic vegetation, such as eelgrass beds. Additionally, a robust population of filter feeders can help modulate plankton blooms.[83]

Naturally occurring populations of native oysters can be found throughout the San Francisco Bay on natural and artificial hard substrate from Carquinez Strait to the South Bay. Intertidally they occur between Point Pinole to south of the Dumbarton Bridge, with the highest reported abundances of 80 per 10.8 square feet in the Central Bay basin.[84] Oysters have appeared to do well subtidally in many human-made habitats such as on marina floats and in tidally restricted ponds, lagoons, and saline lakes.[85] Olympia oysters are expected in rocky intertidal, subtidal habitats in the marine study area and were observed at low densities during the December 2017 site assessment.

---

80 NOAA, Habitat Connections, Restoring the Olympia Oyster (Ostrea conchaphila = lurida), Volume 6, Number 2, 2008, *http://www.oyster-restoration.org/wp-content/uploads/2012/06/OlympiaOysterHabitatConnections.pdf*, accessed August 26, 2015.

81 National Oceanic and Atmospheric Administration (NOAA), Report on the Subtidal Habitats and Associated Biological Taxa in San Francisco Bay, August 2007.

82 NOAA, Habitat Connections, Restoring the Olympia Oyster (Ostrea conchaphila = lurida), Volume 6, Number 2, 2008, *http://www.oyster-restoration.org/wp-content/uploads/2012/06/OlympiaOysterHabitatConnections.pdf*, accessed August 26, 2015.

83 Ibid.

84 10.8 square feet is roughly equivalent to 1 square meter, a standard scientific unit of measurement. San Francisco Bay Subtidal Habitat Goals Report, Appendix 7-1: Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints, September 17, 2010, *http://www.sfbaysubtidal.org/report.html*.

85 San Francisco Bay Subtidal Habitat Goals Report, Appendix 7-1: Shellfish Conservation and Restoration in San Francisco Bay: Opportunities and Constraints, September 17, 2010, *http://www.sfbaysubtidal.org/report.html*.

Critical Habitat

The project site is not located within designated critical habitat for any listed species.[86] Critical habitat for green sturgeon and Central California coast steelhead is designated in the San Francisco Bay and includes the waters adjacent to the project site.

4.I.3 Regulatory Framework

This section briefly describes federal, state, and local regulations, permits, and policies pertaining to both terrestrial and marine biological resources found on or within the project study areas.

Federal Regulations

Federal Endangered Species Act

The Federal Endangered Species Act (16 U.S. Code section 1531 et seq.) designates threatened and endangered animal and plant species and provides measures for their protection and recovery. The "take" of listed plant or wildlife species, defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct," is prohibited without first obtaining a federal permit. Harm includes any act that actually kills or injures fish or wildlife, including significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife. Activities that damage (i.e., harm) the habitat of listed wildlife species require approval from the U.S. Fish and Wildlife Service or National Marine Fisheries Service. The act also generally requires determination of critical habitat for listed species.

For projects that require a federal permit (e.g., from the U.S. Army Corps of Engineers for effects to other jurisdictional waters, as would be the case for the proposed project), the lead federal agency is required by the act (under section 7) to ensure that any action they authorize, implement, or fund will not jeopardize the continued existence of any federally threatened or endangered species or destroy or adversely modify designated critical habitat. Under the Federal Endangered Species Act section 7 consultation, the lead federal agency (e.g., the U.S. Army Corps of Engineers) submits a biological assessment that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat, and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, the U.S. Fish and Wildlife Service or National Marine Fisheries Service then responds to the biological assessment by issuing its biological opinion determining whether the project is likely to adversely affect the species to the extent that it would jeopardize the species or result in adverse modification of critical habitat.

If a *non-jeopardy* or *no adverse modification* opinion is provided by the U.S. Fish and Wildlife Service or National Marine Fisheries Service, the federal agency may proceed with the action as proposed. If a jeopardy or adverse modification opinion is provided, the U.S. Fish and Wildlife Service or National Marine Fisheries Service may prepare a biological opinion that specifies reasonable and prudent measures to minimize take and associated mandatory terms and conditions that describe

86 USFWS Critical Habitat Portal, *http://ecos.fws.gov/crithab/*, accessed February 20, 2018.

the methods for accomplishing these prudent measures and/or also develop mandatory reasonable and prudent alternatives to the proposed action.

Migratory Bird Treaty Act

The Federal Migratory Bird Treaty Act (16 United States Code, section 703, Supp. I, 1989) generally prohibits the killing, possessing, or trading of migratory birds, bird parts, eggs, and nests, except as provided by the statute. This act authorizes the Secretary of the Interior to regulate the taking of migratory birds. It further provides that it is unlawful, except as permitted by regulations, "to pursue, hunt, take, capture, kill or attempt to take, capture, or kill any migratory bird, or any part, nest or egg of any such bird…" Solicitor opinions for various U.S. administrations have varied in their interpretation of "take," and current guidance excludes incidental take as a violation of the Migratory Bird Treaty Act. However, there are examples of Circuit court cases in which non-intentional harm has been determined to be a violation. As interpreted by U.S. Department of the Interior Solicitor's Opinion M-37050 in December 22, 2017 and subsequently by U.S. Fish and Wildlife Service guidance issued on April 11, 2018, the accidental or incidental take of birds resulting from an activity is not prohibited by the Act when the underlying purpose of the activity is not to take birds. Thus, under current guidance the federal Migratory Bird Treaty Act definition of "take" does not prohibit or penalize the incidental take of migratory birds that results from actions that are performed without motivation to harm birds. This interpretation differs from the prior federal interpretation of "take," which prohibited all incidental take of migratory birds, whether intentional or incidental. However, the Act was not amended and guidance on incidental take may change with future administrations.

With respect to nesting birds, although the Migratory Bird Treaty Act itself does not provide specific take avoidance measures, the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife, over time, have developed a set of measures sufficient to demonstrate take avoidance. These requirements include avoiding vegetation removal or ground disturbance during the nesting season (January 15 – August 15), conducting preconstruction nesting bird surveys of a project area during the nesting season, and establishing appropriately-sized protective buffers from construction activities if active nests are found.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972, and as amended, establishes a federal responsibility for the protection and conservation of marine mammal species by prohibiting the harassment, hunting, capture, or killing of any marine mammal. The primary authority for implementing the act belongs to the U.S. Fish and Wildlife Service and National Marine Fisheries Service.

Federal Regulation of Wetlands and Other Waters

Wetlands are ecologically complex habitats that support a variety of both plant and animal life. The federal government defines and regulates other waters, including wetlands, in section 404 of the Clean Water Act. Wetlands are "areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support (and do support, under normal circumstances) a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 Code of Federal Regulations 328.3[b] and 40 Code of Federal Regulations 230.3). Under normal

circumstances, the federal definition of wetlands requires the presence of three identification parameters: wetland hydrology, hydric soils, and hydrophytic vegetation.

The regulations and policies of various federal agencies (e.g., U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service) mandate that the filling of wetlands be avoided unless it can be demonstrated that there is no practicable alternative to filling. The army corps has primary federal responsibility for administering regulations that concern waters and wetlands in the project study area under the statutory authority of the Rivers and Harbors Act (Sections 9 and 10) and the Clean Water Act (section 404).

Pursuant to section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 United States Code section 403), the U.S. Army Corps of Engineers regulates the construction of structures in, over, or under, excavation of material from, or deposition of material into *navigable waters*. In tidal areas, the limit of navigable water under section 10 is the elevation of mean high water mark; in nontidal waters it is the ordinary high water mark. Larger streams, rivers, lakes, bays, and oceans are examples of navigable waters regulated under section 10 of the Rivers and Harbors Appropriation Act. The act prohibits the unauthorized obstruction or alteration of any navigable water (33 United States Code section 403). Navigable waters under the act are those "subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce" (33 Code of Federal Regulations section 3294). Typical activities requiring section 10 permits are construction of piers, wharves, bulkheads, marinas, ramps, floats, intake structures, cable or pipeline crossings, and dredging and excavation.

Section 404 of the Federal Clean Water Act (33 United States Code 1251–1376) prohibits the discharge of dredged or fill material into waters of the U.S., including wetlands, without a permit from the U.S. Army Corps of Engineers. The jurisdiction of the army corps in tidal waters under section 404 extends to the high tide line or high tide mark, simply indicating a point on the shore where water reaches a peak height at some point each year. The Clean Water Act prohibits the discharge of any pollutant without a permit. Implicit in the act definition of *pollutant* is the inclusion of dredged or fill material regulated by section 404 (22 United States Code 1362). The discharge of dredged or fill material typically means adding into waters of the U.S. materials such as concrete, dirt, rock, pilings, or side-cast material for the purpose of replacing an aquatic area with dry land or raising the elevation of an aquatic area. Activities typically regulated under section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur.

Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Act (16 United States Code 1801–1884) of 1976, as amended in 1996 and reauthorized in 2007, applies to fisheries resources and fishing activities in federal waters. Federal waters extend to 200 miles offshore. Conservation and management of U.S. fisheries, development of domestic fisheries, and phasing out of foreign fishing activities are the main objectives of the legislation.

The Magnuson-Stevens Act defines *essential fish habitat* as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The act, as amended through 2007, sets forth a number of new mandates for the National Marine Fisheries Service, regional Fishery

Management Councils, and federal action agencies to identify essential fish habitat and to protect important marine and anadromous fish habitat. The Magnuson-Stevens Act provided the National Marine Fisheries Service with legislative authority to regulate fisheries in the United States in the area between 3 miles and 200 miles offshore and established eight regional Fishery Management Councils that manage the harvest of the fish and shellfish resources in these waters. The councils, with assistance from the marine fisheries service, are required to develop and implement Fishery Management Plans, which include the delineation of essential fish habitat for all managed species. A Fisheries Management Plan is a plan to achieve specified management goals for a fishery and is comprised of data, analyses, and management measures. Essential fish habitat that is identified in a management plan applies to all fish species managed by that plan, regardless of whether the species is a protected species or not. Federal agency actions that fund, permit, or carry out activities that may adversely affect essential fish habitat are required under Section 305(b), in conjunction with required section 7 consultation under the Federal Endangered Species Act, to consult with the National Marine Fisheries Service regarding potential adverse effects of their actions on essential fish habitat and to respond in writing to the marine fisheries service's recommendations.

The waters of the Central Bay basin of the San Francisco Bay are designated as essential fish habitat for fish managed under three Fisheries Management Plans. In total, 13 species of commercially important fish and sharks managed in the Pacific Coast Groundfish and Coastal Pelagic Species management plans use this region of San Francisco Bay as either essential fish habitat or a habitat area of particular concern. In addition, the Pacific Coast Salmon management plan, which includes Chinook salmon, identifies all of the San Francisco Bay as essential fish habitat.[87]

Long Term Management Plan for Dredging in San Francisco Bay

The Long Term Management Strategy Management Plan for maintenance dredging of navigation channels in San Francisco Bay, as established in 2001, provides for a cooperative approach to sediment management in the San Francisco Bay-Delta. It represents a cooperative program among the U.S. EPA, U.S. Army Corps of Engineers, Regional Water Quality Control Board, Bay Conservation and Development Commission, and regional stakeholders, including the National Oceanic and Atmospheric Administration (National Marine Fisheries Service), California Department of Fish and Wildlife, area environmental organizations, and water-related industries. The Long Term Management Strategy facilitates the economical and environmentally responsible maintenance of critical and needed navigation channels in the Bay-Delta and the environmentally responsible disposal of dredged material. It maximizes the use of dredged material as a beneficial resource, and establishes a cooperative permitting framework for dredging, dredged material disposal, and development of beneficial reuse sites for dredge material.

[87] U.S. Army Corps of Engineers, Programmatic Essential Fish Habitat Assessment for the Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region, July 2009.

A key component of the Long Term Management Strategy is the establishment of construction work windows that include periods when construction activities that have the potential to affect aquatic and terrestrial wildlife habitat and migration activity are allowed, restricted, or prohibited. Different restrictions and requirements are enforced depending on the affected species and time of year. If a project proponent wishes to construct during restricted periods, they must formally submit for consultation with the appropriate resource agencies. Through formal consultation, specific measures must be implemented to avoid or reduce potential impacts.

State Regulations

California Endangered Species Act

Under the California Endangered Species Act, the California Department of Fish and Wildlife has the responsibility for maintaining a list of threatened and endangered species (California Fish and Game Code section 2070). The department also maintains a list of candidate species, which are species formally under review for addition to either the list of endangered species or the list of threatened species.

The California Endangered Species Act prohibits the take of plant and animal species that the California Fish and Game Commission has designated as either threatened or endangered in California. *Take* in the context of this regulation means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill a listed species (California Fish and Game Code section 86). The take prohibitions also apply to candidates for listing under the California Endangered Species Act. However, section 2081 of the act allows the department to issue permits for the minor and incidental take of species by an individual or permitted activity listed under the act.

In accordance with the requirements of the California Endangered Species Act, an agency reviewing a project within its jurisdiction must determine if any state-listed endangered or threatened species could be present in the project area. The agency also must determine if the project could have a potentially significant impact on such species. In addition, the department encourages informal consultation on any project that could affect a candidate species.

California Fish and Game Code

Fully Protected Species

Certain species are considered fully protected, meaning that the California Fish and Game Code explicitly prohibits all take of individuals of these species except for take permitted for scientific research. Fully protected amphibians and reptiles, fish, birds, and mammals are listed in sections 5050, 5515, 3511, and 4700, respectively.

It is possible for a species to be protected under the California Fish and Game Code, but not be fully protected. For instance, mountain lion (*Puma concolor*) is protected under section 4800 et seq., but is not a fully protected species.

Protection of Birds and Their Nests

Under section 3503 of the California Fish and Game Code, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Section 3503.5 of the code prohibits take, possession, or destruction of any birds in the orders Falconiformes (hawks) or Strigiformes (owls), or of their nests and eggs. Migratory non-game birds are protected under section 3800, whereas other specified birds are protected under section 3505. California Fish and Game Code section 3513 adopts the federal definition of migratory bird take, which is defined by the Secretary of the Department of the Interior under provisions of the Migratory Bird Treaty Act. Section 3513 does not prohibit the incidental take of birds if the underlying purpose of the activity is not to take birds.

Marine Life Management Act

Within California, most of the legislative authority over fisheries management is enacted within the Marine Life Management Act. This law directs the California Department of Fish and Wildlife and the Fish and Game Commission to issue sport and commercial harvesting licenses, as well as license aquaculture operations. The department, through the commission, is the state's lead biological resource agency and is responsible for enforcement of the state's endangered species regulations and the protection and management of all state biological resources.

State Regulation of Wetlands and Other Waters

California's authority in regulating activities in wetlands and waters in the project area resides primarily with the State Water Resources Control Board. The state water board, acting through the San Francisco Bay Regional Water Quality Control Board, must certify that a U.S. Army Corps of Engineers permit action meets state water quality objectives (Clean Water Act section 401). Any condition of water quality certification is then incorporated into the army corps section 404 permit authorized for the project.

The state water board and regional water board also have jurisdiction over waters of the state under the Porter-Cologne Water Quality Control Act (Porter-Cologne). The state water board and regional water board evaluate proposed actions for consistency with the regional water board's Basin Plan, and authorize impacts on waters of the state by issuing Waste Discharge Requirements or, in some cases, a waiver of Waste Discharge Requirements.

The San Francisco Bay Conservation and Development Commission has jurisdiction over coastal activities occurring within and around the San Francisco Bay and Suisun Marsh. The commission was created by the McAteer-Petris Act (California Government Code sections 66600−66682). The commission regulates fill, extraction of materials, and substantial change in use of land, water, and structures in the San Francisco Bay and development within 100 feet of the bay. The commission has jurisdiction over all areas of the San Francisco Bay that are subject to tidal action, including subtidal areas, intertidal areas, and tidal marsh areas that are between mean high tide and five feet above mean sea level.

Local Regulations

San Francisco General Plan

The Environmental Protection Element of the San Francisco General Plan contains the following objectives and policies related to biological resources protection that are relevant to the proposed project:

General

- **Objective 1 :** Achieve a proper balance among the conservation, utilization, and development of San Francisco's natural resources.

  ***Policy 1.1*:** Conserve and protect the natural resources of San Francisco.

  ***Policy 1.2*:** Improve the quality of natural resources.

  ***Policy 1.3*:** Restore and replenish the supply of natural resources.

  ***Policy 1.4*:** Assure that all new development meets strict environmental quality standards and recognizes human needs.

Bay, Ocean, and Shorelines

- **Objective 3:** Maintain and improve the quality of the bay, ocean, and shoreline areas.

  ***Policy 3.1*:** Cooperate with and otherwise support regulatory programs of existing regional, state, and federal agencies dealing with the Bay.

  ***Policy 3.2*:** Promote the use and development of shoreline areas consistent with the General Plan and the best interest of San Francisco.

Land

- **Objective 7:** Assure that the land resources in San Francisco are used in ways that both respect and preserve the natural values of the land and serve the best interests of all the City's citizens.

Flora and Fauna

- **Objective 8 :** Ensure the protection of plant and animal life in the City.

  ***Policy 8.1*:** Cooperate with and otherwise support the California Department of Fish and Game and its animal protection programs.

  ***Policy 8.2*:** Protect the habitats of known plant and animal species that require a relatively natural environment.

  ***Policy 8.3*:** Protect rare and endangered species.

San Francisco Public Works Code

The San Francisco's Urban Forestry Ordinance (article 16 of the San Francisco Public Works Code) protects street trees, significant trees, and landmark trees under San Francisco Public Works jurisdiction, regardless of species. Permits are required for planting or removing street trees and significant trees, and protection measures are required for these trees if construction work would

occur within the trees' *drip lines*.[88] No significant trees or landmark trees occur on or adjacent to the project site. As discussed under Environmental Setting, there are 20 street trees located on Illinois Street and 22nd Street adjacent to the project site. Of these street trees, the 13 trees along Illinois Street would be removed under the project and the 7 trees along 22nd Street would be retained.

San Francisco Planning Code 139 (Standards for Bird-Safe Buildings)

The San Francisco Planning Department adopted *Standards for Bird-Safe Buildings* in 2011, adding San Francisco Planning Code section 139.[89] These standards guide the use and types of glass and façade treatments, wind generators and grates, and lighting treatments. The standards impose requirements for bird-safe glazing and lighting in structures or at sites that represent a hazard to birds and provide information on educational and voluntary programs related to bird hazards. The standards define two types of bird hazards: location-related hazards and feature-related hazards.

Location-related hazards are buildings located inside of, or within a clear flight path of less than 300 feet from, an *Urban Bird Refuge*,[90] such as the waterfront park included in the proposed project. In such locations, bird-safe treatments are required for new buildings; for additions to existing buildings; or for existing buildings in which 50 percent or more of the glazing within the *bird collision zone* is to be replaced.[91] The standards require implementation of the following treatments for façades facing, or located within, an Urban Bird Refuge:

- No more than 10 percent untreated glazing is allowed on building façades within the bird collision zone.
- Lighting must be shielded, and no uplighting is permitted. No event searchlights are permitted.
- Sites are not permitted to use horizontal access windmills or vertical access wind generators that do not appear solid.

Feature-related hazards include building- or structure-related features that are considered potential "bird traps" regardless of location (e.g., glass courtyards, transparent building corners, or clear glass walls on rooftops or balconies). These features must be fully treated (100 percent) with bird-safe glazing.

88 The area defined by the outermost circumference of a tree canopy where water drips from and onto the ground.
89 San Francisco Planning Department, Standards for Bird-Safe Buildings, 2011, *http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*.
90 An Urban Bird Refuge is defined in the Standards for Bird-Safe Buildings as any area of open space 2 acres or larger that is dominated by vegetation, including vegetated landscaping, forest, meadows, grassland, water features, or wetlands; open water; and some green rooftops.
91 The bird collision zone is that portion of the building that begins at grade and extends upward for 60 feet.

4.I.4 Impacts and Mitigation Measures

Significance Criteria

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable criteria were used to determine whether implementing the proposed project would result in a significant impact on biological resources. Implementation of the proposed project would have a significant effect on biological resources if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service;
- 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; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Approach to Analysis

Project Features

Generally speaking, environmental impacts on biological resources could result from implementation of any of the proposed project elements described in this EIR, including demolishing existing buildings and other structures, making shoreline improvements and adding access, making infrastructure improvements, and constructing new infrastructure, buildings, and proposed open spaces.

Those features of the proposed project that could have an effect on biological resources, either terrestrial or marine, as described below, are the same or substantially similar under the proposed flexible land-use program, in which certain blocks on the project site may be designated for either residential or commercial uses, depending on market conditions and soil conditions, which would ultimately determine the type and amount of land uses on those blocks. To the extent that these features may differ somewhat from one to another, they are generally included and accounted for

in an analysis of maximum disturbance within the project site or adjacent waters. The same biological regulatory requirements applicable to the proposed project are equally applicable under the proposed project's options. As the proposed project includes multiple options for wastewater and stormwater collection, different effects associated with the various options are discussed.

The following is a general summary of the proposed project elements pertinent to the biological resources impact analysis.

- Building and infrastructure demolition or rehabilitation and pile driving;
- Tree and vegetation removal;
- Site grading during removal of asphalt, roadways, and other project site infrastructure;
- Ground excavation for remediation activities, construction of underground parking garages and below grade building spaces;
- New building construction that would present collision hazards to birds; and
- Construction along the shoreline comprised of the installation of a fixed, overwater wharf structure, gangway, and floating dock. Construction would include in-water and shoreline work, with a small amount of in-water vibratory hammer or impact hammer pile driving.
- Abandonment of the existing Unit 3 Power Block outfall and cooling water intake structure. A separate stormwater system may be constructed. If so, installation of a stormwater outlet would occur within the vicinity of the existing Unit 3 Power Block intake.
- General physical enhancements to the existing shoreline including the installation of rock slope revetments, bulkheads, and other improvements to address sea level rise.
- Future maintenance dredging may be required to ensure continued vessel access during project operation.

As noted in Chapter 2, Section 2.F.3, the proposed project would incorporate the following standard construction best management practices; these practices shall be included in the construction contract specifications for in-water construction:

- In-water construction activities (i.e., dredging and pile installation) shall be restricted to the National Oceanic and Atmospheric Administration approved seasonal work window (June 1 to November 30), which encompasses the California Department of Fish and Wildlife seasonal work window for Pacific herring.
- No debris, rubbish, creosote-treated wood, soil, silt, sand, cement, concrete, or washings thereof, or other construction-related materials or wastes, oil, or petroleum products shall be allowed to enter into or placed where it would be subject to erosion by rain, wind, or waves and enter into jurisdictional waters.
- Protective measures shall be utilized to prevent accidental discharges to waters during fueling, cleaning, and maintenance.
- Floating booms shall be used to contain debris discharged into waters and any debris shall be removed as soon as possible, and no later than the end of each workday.

- Machinery or construction materials not essential for project improvements shall not be allowed at any time in the intertidal zone. The construction contractors would be responsible for checking daily tide and current reports.
- The sponsor shall have a spill contingency plan for hazardous waste spills into the San Francisco Bay.

To reduce potential effects to biological resources, the following measures shall be implemented by the project for in-water construction, subject to agency review and approval:

- To reduce potential impacts from noise due to pile-driving, the contractor shall implement one or more of the following as needed:
  - Use vibratory methods for installation of steel piles to the extent practicable
  - Use cushion blocks between hammer and piles
  - Implement a "soft start" technique

Each of these techniques is explained in detail in the impacts analysis, below.

Methodology for Analysis of Biological Resources Impacts

Impacts on biological resources are identified and evaluated based on the following: relevant CEQA and local standards, policies, and guidelines; the likelihood that special-status species, sensitive habitats, wetlands and waters, and wildlife corridors are present within the project study area (as described above in the "Environmental Setting"); and the potential effects that project construction, operation, and maintenance might have on these resources. Special-status resources that were determined to have a low or no potential to occur in the study area (individual plant and animal species as presented in Appendix G, Tables BIO-1 through BIO-3) are not considered in the impact analysis.

This section analyzes potential project impacts to biological resources during the construction, operations, and maintenance phases of the proposed project. The impact analysis does not differentiate between the phasing of project construction activities because adverse effects associated with construction activities are assumed to occur on a block-by-block or parcel-by-parcel basis and would be similar as each parcel/block is developed, regardless of the construction phase. Any associated mitigation measures, if recommended to avoid or reduce such effects, would be implemented as parcels are developed, regardless of the development's phasing. The exception to this assumption includes shoreline improvements which would occur in Phase 1 and have different environmental effects than development of inland blocks/parcels. Any proposed mitigation associated with shoreline improvements would specifically apply to those activities.

This impact analysis is divided into two broad categories: terrestrial (includes aerial species) and marine.

Considerations for Analysis of Construction Impacts

The analysis discusses special-status terrestrial and marine animals that could occur in these two respective study areas and identifies the potential temporary impacts, such as those that could affect species or their habitat only during the construction period, and permanent impacts, including substantial alteration or loss of habitat, on those species as a result of construction. The analysis is based on the results of a site reconnaissance survey, database search results, and technical reports, and describes applicable regulations and project construction activities.

Considerations for Analysis of Operational Impacts

Upon completion of project construction, operations would consist of residential, commercial [office, R&D/life science, retail, hotel, entertainment/assembly, PDR], parking, community facilities, and open space land uses and would generally be restricted to the project footprint, adjacent shoreline, and adjacent San Francisco Bay waters. Onsite biological resources would include landscaped park and open space areas adjacent to and including the San Francisco Bay shoreline. Potential long-term, operational impacts on terrestrial and marine biological resources would be limited to bird collisions with project buildings, indirect effects of stormwater runoff to the San Francisco Bay should the separated sewer and stormwater system option be selected, and if necessary, operational dredging of the vessel access channel adjacent to the floating dock.

Methodology for Analysis of Cumulative Impacts

The analysis of cumulative impacts on biological resources uses a list-based approach to analyze the effects of project construction and operation in combination with past, present and reasonably foreseeable future projects within approximately 0.5-miles of the project site. Section 4.A.6, Approach to Cumulative Impact Analysis, describes the overall approach to the cumulative impact analysis and summarizes reasonably foreseeable future projects generally located within 0.5-miles of the project site that could contribute to a cumulative construction or operational impact. Refer to Table 4.A-2 and Figure 4.A-1, pp. 4.A-13 and 4.A-15, for descriptions and locations of potential cumulative projects in the vicinity of the proposed project.

Construction and operations of other nearby projects are considered in the cumulative analysis for both terrestrial and marine biological resources, and it is assumed those projects would have to comply with the same regulatory requirements as the proposed project. The analysis then considers whether there would be a significant adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects, and if so, whether the project's contribution to the cumulative impact would be considerable. Both conditions must apply in order for a project's contribution to cumulative effects to be deemed cumulatively considerable (significant). If so, mitigation measures are identified to reduce the project's contribution to the extent feasible.

Impact Evaluation

Special-Status and Migratory Birds

Impact BI-1: Construction of the proposed project could have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. ***(Less than Significant with Mitigation)***

Construction Impacts

Construction activities within the 29-acre project site, especially those that involve heavy machinery, may adversely affect nesting birds within 100 feet of the project site boundaries during the nesting season (January 15–August 15). While vegetation suitable for nesting birds occurs within the project site and immediate vicinity it is limited to street trees on Illinois Street and 22nd Street, and shrubs in the southeast portion of the site. The project site's current lack of activity, and its and proximity to San Francisco Bay result in an attractive environment for birds to nest, more so than other San Francisco locations that have higher levels of site activity and human presence.

Dilapidated piers within the project study area east and northeast of the project site could provide potential nesting sites for Caspian tern and western gull, which have previously been documented as nesting farther north at Piers 60 and 64. Osprey have previously nested approximately 0.25-mile south of the project site at Pier 80 and could forage or nest within the terrestrial study area. Although not previously documented as nesting in the study area, American peregrine falcon could nest in or on existing buildings on the project site. Project in-water construction activities would not substantially disrupt foraging activities of California least tern, California brown pelican, or Clark's grebe, which may use open water habitat and shorelines of the project study area as these species are able to forage in similar eastern shoreline waters during periods of in-water work. These species do not nest locally and therefore the project would not adversely affect breeding or nesting behavior. Common species, such as white-crowned sparrow, house finch, Anna's hummingbird, Allen's hummingbird, mourning dove, black phoebe, barn swallow, cliff swallow, also have the potential to nest in street trees or ruderal shrub vegetation, on the ground, or within or on top of existing buildings of the project site. Each of these species and their nests are afforded protection by the California Fish and Game Code, as described above under "Regulatory Framework." The proposed project would be required to comply with these regulations to avoid take of individual birds, eggs, and their nests.

Project construction activities and an increased human presence at the project site are expected to generate noise and visual disturbances that could adversely affect bird breeding and nesting behaviors at the project site and nearby. Proposed project construction activities may cause visual disturbance, alter the ambient noise environment, or introduce short-term loud noise events, resulting in avoidance response (flushing).

Both long- and short-term loud noises can affect bird foraging and roosting by temporarily disturbing these behaviors and may deter bird use of an area (including for nesting) if such noises persist over the long term. Noise disturbance generally falls into two main categories: impulse and continuous. Impulse disturbances often used in demolition activities include single actions like blasts, or multiple actions like jackhammers and pile drivers. Continuous noise includes typical construction work area activities and roadway noise. Bird disruption from visual or noise disturbance varies, but typically birds will avoid disturbance areas and move to more preferable environments. However, some species inhabit noisy areas and may indirectly benefit from reduced competition and predation.[92]

Birds currently residing in both the terrestrial and marine study areas are accustomed to varying levels of ambient noise emanating from existing human activities in the study area. For example, pedestrians and vehicular traffic are consistent throughout the day and various remediation activities are ongoing in the project study area on a regular basis. Nearby the project site, the primary sources of noise are various industrial activities at the American Industrial Center, PG&E Potrero Substation, and PG&E Hoedown Yard, onsite remediation activities, new development-related construction activities along Illinois Street and the Pier 70 site, traffic on local streets (Illinois Street, Third Street, 22nd Street, and 23rd Street), and the distant I-280 freeway. Noise measurements indicate that noise levels range from 56 to 60 dBA (L_{dn}) over most of the site, with higher noise levels (71 dBA [L_{dn}]) immediately adjacent to Illinois Street (see Table 4.F-3 in Section 4.F, Noise). Typical noise levels for some construction activities anticipated during project implementation would exceed ambient levels near the project site. Construction activities that would substantially alter the noise environment could disrupt birds attempting to nest, disrupt parental foraging activity, or displace mated pairs with territories in the project study area. Given the long buildout period for the proposed project, the potential impacts of noise and visual disturbance on breeding birds are likely to occur over several nesting seasons, with the highest potential impacts associated with initial disturbance to idle areas of the site. As the project progresses and the level of disturbance on the site increases with development, nesting birds are less likely to be attracted to the site, and the potential for construction-related impacts on birds and their nests would decrease. Overall avian activity within the study area is not expected to substantially change due to project construction activities because terrestrial habitat values are limited, and aquatic habitat for birds foraging and nesting would not substantially change.

The loss of an active nest attributable to project construction activities would be considered a significant impact under CEQA**.** Nesting habitat for birds within the developed project site is of limited value and not expected to attract an abundance of breeding birds; however, certain construction activities such as vegetation removal, building demolition, and shoreline improvements, could adversely affect birds attempting to nest within the project site or nearby. This would be a significant impact. **Mitigation Measure M-BI-1**, **Nesting Bird Protection Measures**, and compliance with the requirements of the California Fish and Game Code, would avoid or reduce potential impacts on nesting migratory and special-status birds to a less-than-significant level. Therefore, this impact would be ***less than significant with mitigation***.

[92] Francis, Clinton D., Catherine P. Ortega, and Alexander Cruz, Noise Pollution Changes Avian Communities and Species Interactions. Current Biology 19:1415–1419, August 25, 2009.

Mitigation Measure M-BI-1: Nesting Bird Protection Measures

The project sponsor shall require that all construction contractors implement the following measures for each construction phase to ensure protection of nesting birds and their nests during construction:

1. To the extent feasible, conduct initial project activities outside of the nesting season (January 15–August 15). These activities include, but are not limited to: vegetation removal, tree trimming or removal, ground disturbance, building demolition, site grading, and other construction activities that may impact nesting birds or the success of their nests (e.g., controlled rock fragmentation, blasting, or pile driving).

2. For construction activities that occur during the bird nesting season, a qualified wildlife biologist[93] shall conduct pre-construction nesting surveys within 14 days prior to the start of construction or demolition at areas that have not been previously disturbed by project activities or after any construction breaks of 14 days or more. Surveys shall be performed for suitable habitat within 100 feet of the project site in order to locate any active passerine (perching bird) nests and within 100 feet of the project site to locate any active raptor (birds of prey) nests, waterbird nesting pairs, or colonies.

3. If active nests protected by federal or state law[94] are located during the preconstruction bird nesting surveys, a qualified biologist shall evaluate if the schedule of construction activities could affect the active nests and if so, the following measures would apply:

    a. If construction is not likely to affect the active nest, construction may proceed without restriction; however, a qualified biologist shall regularly monitor the nest at a frequency determined appropriate for the surrounding construction activity to confirm there is no adverse effect. The qualified biologist would determine spot-check monitoring frequency on a nest-by-nest basis considering the particular construction activity, duration, proximity to the nest, and physical barriers that may screen activity from the nest. The qualified biologist may revise his/her determination at any time during the nesting season in coordination with the Environmental Review Officer (ERO).

    b. If it is determined that construction may affect the active nest, the qualified biologist shall establish a 100-foot no-disturbance buffer around the nest(s) and all project work shall halt within the buffer until a qualified biologist determines the nest is no longer in use. Given the developed condition of the site and its surroundings, the qualified biologist may adjust the buffer based on the nature of proposed activities or site specific conditions.

93 Typical experience requirements for a "qualified biologist" include a minimum of four years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of two years of experience conducting surveys for each species that may be present within the project area.

94 These would include species protected by the federal Endangered Species Act, Migratory Bird Treaty Act, California Endangered Species Act, and California Fish and Game Code and does not apply to rock pigeon, house sparrow, or European starling. U.S. Fish and Wildlife Service and California Department of Fish and Wildlife are the federal and state agencies, respectively, with regulatory authority over protected birds and are the agencies that would be engaged with, if nesting occurs onsite and protective buffer distances and/or construction activities within such a buffer would need to be modified while a nest is still active.

c. Modifying nest buffer distances, allowing certain construction activities within the buffer, and/or modifying construction methods in proximity to active nests shall be done at the discretion of the qualified biologist and in coordination with the ERO, who would notify the California Department of Fish and Wildlife.

d. Any work that must occur within established no-disturbance buffers around active nests shall be monitored by a qualified biologist. If the qualified biologist observes adverse effects in response to project work within the buffer that could compromise the active nest, work within the no-disturbance buffer(s) shall halt until the nest occupants have fledged.

e. With some exceptions, birds that begin nesting within the project area amid construction activities are assumed to be habituated to construction-related or similar noise and disturbance levels. Exclusion zones around such nests may be reduced or eliminated in these cases as determined by the qualified biologist in coordination with the ERO, who would notify the California Department of Fish and Wildlife. Work may proceed around these active nests as long as the nests and their occupants are not directly impacted.

Significance after Mitigation: Less than Significant

Impact BI-2: Operation of the proposed project would not have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. *(Less than Significant)*

The project site is located within the Pacific Flyway along the western shoreline of the San Francisco Bay. The waters of the San Francisco Bay provide valuable stopover habitat for migratory birds that forage and replenish energy stores during spring and fall migrations. Open space, even in highly urbanized areas, attracts avifauna, and any habitat in proximity to the proposed new buildings, such as park lands, landscape vegetation, or the bay, that could be used for foraging, roosting, or rest by birds on the wing (in flight) may increase the risk of bird collisions, particularly if large amounts of reflective or artificially lighted surfaces are included in the project's design.

Due to the surrounding urban setting, the proposed project is not expected to appreciably increase the overall amount of lighting along the San Francisco waterfront as a whole, considering existing nighttime lighting conditions within the project site and surrounding development along the eastern shoreline from San Francisco Bay Bridge to Hunters Point. However, avian collisions with glass or reflective surfaces used in the proposed buildings could result in mortality, which would be a significant impact under CEQA.

The proposed project would comply with the City of San Francisco's adopted *Standards for Bird-Safe Buildings*[95] (planning code section 139) and would incorporate specific design elements into

[95] San Francisco Planning Department, Standards for Bird-Safe Buildings, 2011, *http://www.sf-planning.org/ftp/files/publications_reports/bird_safe_bldgs/Standards%20for%20Bird%20Safe%20Buildings%20-%2011-30-11.pdf*.

the development to avoid or minimize avian collisions with buildings or other project features. The City's *Standards for Bird-Safe Buildings* reflect the most current and accepted measures to prevent bird strikes.

The Standards for Bird-Safe Buildings address location-related hazards and/or feature-related hazards for birds on the wing and describe glass and façade treatments, wind generators and grates, and lighting treatments for buildings that can reduce avian collisions. The standards state that all buildings within an Urban Bird Refuge present location-related hazards for birds. The proposed 3.7-acre waterfront park would qualify as an Urban Bird Refuge, providing a sufficient area of open space to attract avifauna. Thus, new building façades or additions to existing structures located inside of, or within a clear flight path less than 300 feet of the shoreline would require certain treatments within the bird collision zone. Some examples include creating a visual signal or a visual noise barrier that alerts birds to the presence of glass objects, such as ceramic dots, or *frits*[96] applied between layers of insulated glass to reduce transmission of light.

Feature-related hazards include building- or structure-related features that are considered potential *bird traps,* (e.g., glass courtyards, transparent building corners, or clear glass walls on rooftops or balconies) regardless of location. If these elements are used in the proposed buildings or structures, they must be fully treated (100 percent) with bird-safe glazing.

Project compliance with the *Standards for Bird-Safe Buildings*, as administered by the San Francisco Planning Department, would avoid or minimize the adverse effects of avian collisions during project operation; therefore, this impact would be ***less than significant***, and no mitigation is necessary.

Mitigation: None required.

Special-Status and Otherwise Protected Bats

Impact BI-3: Construction of the proposed project could have a substantial adverse effect either directly or through habitat modification on bats identified as special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U. S. Fish and Wildlife Service. (Less than Significant with Mitigation)

Common bats (Mexican free-tailed bat) and special-status bats (Pallid bat and Yuma myotis) have the potential to roost in existing vacant or underutilized buildings, and other human-made structures within or near the project site. Station A (buildings 15, 16, 17 [see Chapter 2, Project Description Figure 2-3, p. 2-8]) in particular provides potential roosting habitat for bats due to the long vacancy of the buildings, multiple stories and rooms with supportive surfaces to establish roosts, numerous entry points through openings in the walls and roofs, and proximity to foraging sites along the eastern shoreline of the San Francisco Peninsula. The Unit 3 Power Block and the Boiler Stack (buildings 22, 23, 24, and 25 on Figure 2-3, p. 2-8) provide a similar roost opportunity for bats. Other

[96] Frits are lines, dots, or other patterns incorporated into the glass or applied on its surface to make it more visible.

buildings on the project site that would be demolished or rehabilitated under the proposed project offer varying roost habitat value to bats depending on the condition of the building and regularity of human activity. While some bat species that prefer to roost beneath the exfoliation bark or trees or among leaves might occur in the project study area (e.g., western red bat), the street trees along Illinois Street that would be removed under the project do not provide suitable roost habitat given the consistent human disturbance along this street and low tree density. Removal of these trees is not anticipated to adversely affect special-status or common bats.

Bats and other non-game mammals are protected in California under the California Fish and Game Code (described above in "Regulatory Framework"). Maternity roosts are roosts occupied by pregnant females or females with non-flying young. Non-breeding roosts are day roosts without pregnant females or non-flying young. Destruction of an occupied, non-breeding bat roost, resulting in the death of bats; disturbance that causes the loss of a maternity colony of bats (resulting in the death of young); or destruction of *hibernacula*[97] are prohibited under the California Fish and Game Code and would be considered a significant impact (although hibernacula generally are not formed by bat species in the Bay Area due to sufficiently high temperatures year round). Construction-associated noise or vibration, or increased human activity in the area during general construction could result in behavioral alterations including the temporary avoidance of work areas by foraging bats during construction. Such temporary alteration of behavior during construction would be a less-than-significant impact.

The proposed project would involve building demolition and/or rehabilitation of buildings or structures that could host roosting bats. Demolition and/or rehabilitation of buildings or structures, particularly unoccupied buildings such as Station A and the Unit 3 Power Block buildings could result in direct mortality of or indirect disturbance to roosting special-status bats (e.g., bats avoid routine foraging or fail to return to a maternity roost due to an increase in human presence on the project site), if present. However, mortality of special-status bats resulting from direct actions (e.g., destruction of an occupied roost) or indirect actions (e.g., elevated noise or vibration which causes roost or young abandonment) attributable to project construction would be a significant impact. Additionally, common bats may establish maternity roosts in these same locations and disturbance that results in loss of a maternity colony would be a significant impact. The implementation of **Mitigation Measure M-BI-3**, **Avoidance and Minimization Measures for Bats**, would reduce potential impacts on special-status bats and common bat maternity roosts to a less-than-significant level by requiring preconstruction surveys and implementing avoidance measures if potential roosting habitat or active roosts are located.

Mitigation Measure M-BI-3: Avoidance and Minimization Measures for Bats

A qualified biologist[98] who is experienced with bat surveying techniques (including auditory sampling methods), behavior, roosting habitat, and identification of local bat species shall be consulted prior to demolition or building rehabilitation activities to conduct a pre-construction habitat assessment of the project site (focusing on buildings to

97 Hibernaculum refers to the winter quarters of a hibernating animal. Hibernacula is the plural form of the word.
98 Typical experience requirements for a qualified biologist include a minimum of four years of academic training and professional experience in biological sciences and related resource management activities, and a minimum of two years of experience conducting surveys for each species that may be present within the project area.

be demolished or rehabilitated under the project) to characterize potential bat habitat and identify potentially active roost sites. No further action is required should the pre-construction habitat assessment not identify bat habitat or signs of potentially active bat roosts within the project site (e.g., guano, urine staining, dead bats, etc.).

The following measures shall be implemented should potential roosting habitat or potentially active bat roosts be identified during the habitat assessment in buildings to be demolished or rehabilitated under the proposed project:

1. In areas identified as potential roosting habitat during the habitat assessment, initial building demolition or rehabilitation shall occur when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15, to the extent feasible. These dates avoid the bat maternity roosting season and period of winter *torpor*.[99]

2. Depending on temporal guidance as defined below, the qualified biologist shall conduct pre-construction surveys of potential bat roost sites identified during the initial habitat assessment no more than 14 days prior to building demolition or rehabilitation.

3. If active bat roosts or evidence of roosting is identified during pre-construction surveys, the qualified biologist shall determine, if possible, the type of roost and species. A no-disturbance buffer shall be established around roost sites until the qualified biologist determines they are no longer active. The size of the no-disturbance buffer would be determined by the qualified biologist and would depend on the species present, roost type, existing screening around the roost site (such as dense vegetation or a building), as well as the type of construction activity that would occur around the roost site.

4. If special-status bat species or maternity or hibernation roosts are detected during these surveys, appropriate species- and roost-specific avoidance and protection measures shall be developed by the qualified biologist in coordination with the California Department of Fish and Wildlife. Such measures may include postponing the removal of buildings or structures, establishing exclusionary work buffers while the roost is active (e.g., 100-foot no-disturbance buffer), or other avoidance measures.

5. The qualified biologist shall be present during building demolition or rehabilitation if potential bat roosting habitat or active bat roosts are present. Buildings with active roosts shall be disturbed only under clear weather conditions when precipitation is not forecast for three days and when daytime temperatures are at least 50 degrees Fahrenheit.

6. The demolition or rehabilitation of buildings containing or suspected to contain bat roosting habitat or active bat roosts shall be done under the supervision of the qualified biologist. When appropriate, buildings shall be partially dismantled to significantly change the roost conditions, causing bats to abandon and not return to the roost, likely in the evening and after bats have emerged from the roost to forage. Under no circumstances shall active maternity roosts be disturbed until the roost disbands at the

[99] Torpor refers to a state of decreased physiological activity with reduced body temperature and metabolic rate.

completion of the maternity roosting season or otherwise becomes inactive, as determined by the qualified biologist.

Significance after Mitigation: Less than Significant

Special-Status Marine Species

Impact BI-4: Construction of the proposed project could have a substantial adverse effect, either directly or through habitat modification, on marine 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, U.S. Fish and Wildlife Service, or National Oceanic and Atmospheric Administration. ***(Less than Significant with Mitigation)***

The waters of the Central San Francisco Bay are home to a number of state and federally protected marine species and habitats; and for a few of these species, the bay is considered their critical habitat. These species include multiple runs of steelhead and chinook salmon, green sturgeon, longfin smelt, and Pacific herring. Additionally, portions of the project study area fall within waters designated as Essential Fish Habitat for approximately 20 species of fish, managed under three federal fisheries management plans. While no endangered or threatened marine mammals occur within the San Francisco Bay, multiple species protected under the Marine Mammal Protection Act are either permanent inhabitants or frequent visitors to bay waters. Those most likely to occur within the project study area are harbor seals and California sea lions.

There is the potential for significant impacts to a range of protected marine resources to occur during project construction in and adjacent to the San Francisco Bay.

Commensurate with any construction activity adjacent to, or within, an aquatic environment is the potential for the accidental discharge of hydrocarbon containing materials (e.g., fuel, lubricating oils, construction materials), construction debris, or other harmful materials. Such construction activities could pose a short-term and temporary risk of exposing resident marine taxa to toxic contaminants and non-edible forage. However, the proposed project includes in-water construction avoidance and minimization measures (see Chapter 2, Project Description, Section 2.F.4). These measures include: the use of floating booms to contain debris discharge into waters, the sequestering of non-essential machinery or construction materials outside the intertidal zone, and the development of a spill contingency plan for any hazardous spill that does occur. Other best management practices (BMPs) include installing secondary containment under all temporary fuel storage; using drip pans; using secondary containment or drip sheeting under parked construction equipment; using drain covers to seal off onsite storm drains; and adhering to specific requirements issued by the regional board for stormwater discharges within the City and County of San Francisco and in accordance with the statewide stormwater permit, which contains additional actions to prevent and/or reduce project site sediment and other contaminants from reaching San Francisco Bay waters resulting in an impact to resident offshore biological resources. For a more detailed description of state and local regulations governing stormwater management during project construction see Section 4.J, Hydrology and Water Quality, Subsection 4.J.3, Regulatory Framework.

Demolition and remediation activities at the project site could also result in extensive ground disturbance and increased surface run-off through existing stormwater drains to the San Francisco Bay, resulting in increased sedimentation and organic and inorganic contaminant loading to San Francisco Bay waters and low-level exposure to protected species. Potential impacts on special-status fish and marine mammal species due to increased contaminant loading to San Francisco Bay waters from low-level contaminated sediments could be significant if uncontrolled. Implementation of standard construction and demolition BMPs would be required as part of City and County of San Francisco and state (Bay Conservation and Development Commission and Regional Water Quality Control Board) permits to prevent toxic contaminants and disturbed sediments from reaching storm drains; these measures, such as installing drip pans beneath stationary equipment, using sediment curtains and storm drain covers and regularly sweeping streets, would be expected to reduce these potential impacts to a less-than-significant level. Specific requirements issued by the regional water board for stormwater discharges within the City and County of San Francisco in accordance with the statewide stormwater permit (see Section 4.J, Hydrology and Water Quality, specifically Subsection 4.J.3, Regulatory Framework), contain additional actions to prevent and/or reduce project site contaminants and sediment from reaching bay waters and causing any significant effect on resident offshore biological resources. (See also the water quality discussion under Impact BI-6; also see Section 4.J, Hydrology and Water Quality.)

Potential impacts to water quality during construction may result from the in-water installation of support piles for the proposed overwater wharf and pier structure, and, to a lesser degree, from the adjacent shoreline enhancement work and outfall construction. Pile installation that requires an impact or vibratory hammer may cause short-term impacts to water quality through the resuspension of benthic sediments. Increased suspended solids in the water column have the potential to affect special-status fish species by disrupting normal feeding behavior, reducing growth rates, increasing stress levels, and reducing respiratory functions. Additionally, the suspension of sediment has the potential to release constituents of concern within the water column. However, due to the limited scope of the proposed in-water work, increased turbidity levels would be relatively short-lived and generally confined to within a few hundred yards of the activity.

Recent studies suggest that the short-term impacts of dredging on sensitive fish species are typically minor. Considering that the volume of sediment being disturbed by pile installation would be a substantially smaller fraction (by orders of magnitude) of that disturbed by even a small dredging operation, and the limited duration of in-water construction activities, water quality impacts of pile installation would be less than significant.

Construction of Proposed Stormwater Outfall

As presented in detail in Chapter 2, Project Description, Section 4.J, Hydrology and Water Quality, and in Appendix B, Initial Study Section 10, Utilities and Service Systems, the proposed project is considering two options for wastewater and stormwater collection within the project site: 1) a dual combined sewer (i.e., sanitary sewage combined with stormwater flows)/separated stormwater system configured to maintain existing drainage patterns, and 2) a project-wide combined sewer system. The dual combined sewer/separated sewer option is the preferred option included in the proposed project. Only the dual combined sewer/separated sewer option has the potential to

substantially affect the adjacent aquatic environment, as storm flows would be discharged into San Francisco Bay from a new outfall constructed as part of the proposed project; the project-wide combined sewer system option would convey both sanitary sewage and stormwater flows to the existing combined sewer system infrastructure (see Section 4.J, Hydrology and Water Quality, for further discussion).

Under the dual system (preferred option), collected storm flows would be conveyed through the new system to a new outfall on the east side of the project site near the former Unit 3 Power Block intake. Only the dual system option would require construction of a new outfall into San Francisco Bay. The construction of this outfall would be expected to result in short-term disturbance to existing soft subtidal[100] habitat, adjacent rocky intertidal habitat (consisting of riprap shoreline armoring), and associated biological communities. Although the potential disturbance and/or loss of these habitats and associated marine communities could affect special-status fish and marine mammal foraging, the overall effect would be minor because of the very small area being disturbed and the temporary nature of the construction disturbance. Additionally, the footprint along the shoreline within which the new outfall would be constructed is small relative to the size of the proposed area of shoreline enhancement. Currently, the proposed outfall location exists within heavily disturbed intertidal habitat. As such, the outfall construction is unlikely to result in any impacts to existing aquatic resources.

While a few scattered oysters were observed within the intertidal portion of the project site it is unlikely that the outfall construction would have a significant impact on the overall local oyster population. Given the small footprint of the outfall structure and discharge site, relative to the large amounts of intertidal shoreline made available by enhancement with implementation of the project, the overall of effect of outfall construction and stormwater discharge would be minor and less than significant.

Temporary Underwater Noise

Of primary concern with the in-water installation of piles is the potential for the generation of underwater noise at a level that is harmful to marine species. Pile driving can produce high-intensity noise resulting in damage to the soft tissues of fish, such as gas bladders or eyes (barotraumas) and/or result in harassment of fish and marine mammals such that they alter swimming, sleeping, or foraging behavior or temporarily abandon forage habitat.

The striking of a pile by a pile-driving hammer creates a pulse of sound that propagates through the pile, radiating out through the water column, seafloor, and air. Sound pressure pulses, as a function of time are referred to as a waveform. Peak waveform pressure underwater is typically expressed in decibels (dB) referenced to 1 microPascal (μPa).[101] Sound levels are generally reported as peak levels, root-mean-square pressure, and sound exposure levels. The peak pressure is the highest absolute value of the measured waveform. For pile driving pulses, the root-mean-square pressure level is determined by analyzing the waveform and computing the average of the squared pressures over time that comprise the portion of the waveform containing the vast majority of sound energy. Sound exposure level is a metric that provides an indication of the amount of

[100] Subtidal means occurring below the surface of the water.
[101] Therefore, 0 dB on the decibel scale would be a measure of sound pressure of 1 μPa.

acoustical energy contained in a sound event. For pile driving, sound exposure level can be used to describe a single pile driving pulse or many cumulative pulses when required to drive multiple piles. In addition to the pressure pulse of the waveform, the frequency of the sound, expressed in hertz is also important to evaluating the potential for sound impacts. Low frequency sounds are typically capable of traveling over greater distances with less reduction in the pressure waveform than high frequency sounds.

Vibratory pile drivers work on a different principle than pile-driving hammers and therein produce a different sound profile. A vibratory driver works by inducting particle motion to the substrate immediately below and around the pile causing liquefaction of the immediately adjacent soft substrate, allowing the pile to sink downward. Sound levels are typically 10-20 dB lower in intensity relative to the higher, pulse-type noise produced by an impact hammer.[102]

A preliminary evaluation of the construction methods required for the installation of the overwater wharf and associated floating dock structures indicate that approximately nine 24-inch octagonal concrete piles would be required to support the wharf structure, three of which would be driven in water (below mean higher high water). The floating dock attached to the wharf would be supported by approximately four 36-inch steel pipe piles, all driven in water. Due to the lack of detailed soil data at this location, the exact installation methodology is currently unknown; however, based upon the installation methods required under similar projects, a diesel impact hammer is likely to be required. The exact pile configuration and installation methods (i.e., impact hammer vs. vibratory pile driver) are still under review and subject to change.

Impacts to Fish

Scientific investigations on the potential effects of noise on fish indicate that sound levels below the 183 dB sound exposure level do not appear to result in any acute physical damage or mortality to fish (*barotraumas*) of any size.[103] **Table 4.I-1** provides a summary of known acute and sub-lethal effects of noise on fish. Noise levels that result in startle responses in steelhead trout and salmon have been documented to occur at sound levels as low as 150 dB root-mean-square pressure level.[104] Any disturbance to federal or state-listed fish species that results in altered swimming, foraging, movement along a migration corridor, or any other altered normal behavior is considered harassment, a potentially significant impact.[105]

[102] Caltrans, Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Final Report, prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2015.

[103] Dalen, J. and G.M. Knutsen, Scaring effects of fish and harmful effects on eggs, larvae and fry from offshore seismic explorations, ICA Associated Symposium on Underwater Acoustics, 16-18 July 1986, Halifax, Canada.

[104] Halvorsen MB, Casper BM, Woodley CM, Carlson TJ, Popper AN., Threshold for onset of injury in Chinook salmon from exposure to impulsive pile driving sounds, PLOS ONE 7(6): e38968. Oi: 10.1371/ journal.pone.0038968, 2012.

[105] It should be noted that the acoustic thresholds shown in Table 4.M-1 regard sound levels generated for impact pile driving, no criteria for vibratory pile driving exist at this time.

TABLE 4.I-1
POTENTIAL EFFECTS TO FISH AT VARYING NOISE LEVELS

Taxa	Sound Level (dB)	Effect	Reference
Fish			
All fish > 2 grams in size	206 peak 187 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008
All fish < 2grams	186 (SEL)	Acute Barotraumas	Fisheries Hydroacoustic Working Group, 2008
Salmon, steelhead	150 (RMS)	Avoidance behavior	Halvorsen et al. 2012

NOTES: SEL = sound exposure level; RMS = root-mean-square pressure level

Impacts to Marine Mammals

Pursuant to the Marine Mammal Protection Act, the National Marine Fisheries Service has established two levels of harassment related to marine mammals:

- **Level A:** Any act of pursuit, torment or annoyance which has the potential to injure a marine mammal or marine mammal stock in the wild.
- **Level B:** Any act of pursuit, torment, or annoyance which has the potential to disturb a marine mammal or marine mammal stock in the wild by causing the disruption of behavioral patterns, including but not limited to migration, breathing, nursing, breeding, feeding or sheltering.

The National Marine Fisheries Service has applied sound thresholds to each of these harassment categories depending on the species of marine mammal. To be considered Level A harassment, cetaceans and pinnipeds must be exposed to sound levels of 180 and 190 dB root-mean-square pressure level or greater, respectively. Level B, behavioral harassment is considered to occur when any marine mammal is exposed to 160 dB root-mean-square pressure level for impact pile driving and 120 dB root-mean-square pressure level for vibratory pile driving (**Table 4.I-2**). It should be noted that ambient underwater noise for the San Francisco Bay and the Oakland Inner Harbor was measured at between 120 and 150 dB as part of sound monitoring conducted for the San Francisco/Oakland Bay Bridge Project.[106]

TABLE 4.I-2
ADOPTED UNDERWATER ACOUSTIC CRITERIA FOR MARINE MAMMALS

	Underwater Noise Thresholds (dB)				
	Vibratory Pile Driving Disturbance Threshold	Impact Pile Driving Disturbance Threshold		SEL Threshold (dB)	
Family			Species	Impact	Vibratory
Cetacean	120 dB RMS	160 dB RMS	Harbor porpoise	155 dB	173 dB
Pinniped	120 dB RMS	160 dB RMS	Harbor seal	185 dB	201 dB
			California sea lion	203 dB	219 dB

NOTES: dB = decibel; RMS = root-mean-square pressure level

SOURCE: U.S. Department of Commerce, NOAA, *NOAA Technical Memorandum NMFS-OPR-55, Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts*, 2016.

106 Caltrans, Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Final Report, prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2015.

As stated above under "Project Features," and in Chapter 2, the proposed project would incorporate standard in-water work best management practices. These practices would include the observance of the National Marine Fisheries Service approved in-water work windows, which were developed for San Francisco Bay as part of section 7 consultations with resource agencies (National Marine Fisheries Service and U.S. Fish and Wildlife Service) for the Long Term Management Strategy Management Program for managing sediment within San Francisco Bay.[107] These regionally-specific windows are designed based on the life history of special-status fish species to reduce the likelihood that these fish species might occur within the area in which in-water work is proposed.

Additional best management practices related specifically to the in-water installation of piles include, when feasible, the use of vibratory hammers in place of impact hammers, the use of cushion blocks, and the implementation of a "soft start" technique. Vibratory hammers have been demonstrated to produce sound levels of a lower intensity relative to higher, pulse-type noise produce by impact hammers, thus reducing the potential impact on fish and marine mammals.[108] A cushion block is often placed between the impact hammer and pile and can potentially substantially reduce the amount of energy delivered to the pile – thereby reducing the sound pressure levels generated.[109] During a "soft start" a pile is initially driven with low hammer energy. This movement of the pile through the water column and initial contact with the bay floor gives any fish or marine mammals present a chance to leave the immediate area.

Nevertheless, given the uncertainties regarding the exact pile configuration and installation methods to be used for proposed in-water construction, there remains a potential that construction of the project could have an adverse effect on protected fish or marine mammals, a significant impact. However, implementation of the proposed in-water construction best management practices together with **Mitigation Measure M-BI-4**, **Fish and Marine Mammal Protection during Pile Driving**, would ensure that potential impacts from pile installation are less-than-significant. Therefore, construction impacts on special-status marine species would be ***less than significant with mitigation***.

> **Mitigation Measure M-BI-4: Fish and Marine Mammal Protection during Pile Driving**
>
> Prior to the start of any in-water construction that would require pile driving, the project sponsor shall prepare a National Marine Fisheries Service-approved sound attenuation monitoring plan to protect fish and marine mammals, and the approved plan shall be implemented during construction. This plan shall provide detail on the sound attenuation system, detail methods used to monitor and verify sound levels during pile driving activities (if required based on projected in-water noise levels), and describe best management practices to reduce impact pile-driving in the aquatic environment to an intensity level less than 183 dB (sound exposure level, SEL) impulse noise level for fish at a distance of 33 feet, and 160 dB (root mean square pressure level, RMS) impulse noise

[107] U.S. Army Corps of Engineers (USACE), Framework for Assessment of Potential Effects of Dredging on Sensitive Fish Species in San Francisco Bay. Final Report, prepared for USACE by Levine Fricke, 2004.
[108] Caltrans, Technical guidance for assessment and mitigation of the hydroacoustic effects of pile driving on fish. Final Report, prepared for California Department of Transportation by ICF Jones & Stokes and Illingworth & Rodkin, Inc., 2015.
[109] Ibid.

level or 120 dB (RMS) continuous noise level for marine mammals at a distance of 1,640 feet. The plan shall incorporate, but not be limited to, the following best management practices:

- All in-water construction shall be conducted within the established environmental work window between June 1 and November 30, designed to avoid potential impacts to fish species.
- To the extent feasible vibratory pile drivers shall be used for the installation of all support piles. Vibratory pile driving shall be conducted following the U.S. Army Corps of Engineers "Proposed Procedures for Permitting Projects that will Not Adversely Affect Selected Listed Species in California." U. S. Fish and Wildlife Service and National Marine Fisheries Service completed section 7 consultation on this document, which establishes general procedures for minimizing impacts to natural resources associated with projects in or adjacent to jurisdictional waters.
- A soft start technique to impact hammer pile driving shall be implemented, at the start of each work day or after a break in impact hammer driving of 30 minutes or more, to give fish and marine mammals an opportunity to vacate the area.
- If during the use of an impact hammer, established National Marine Fisheries Service pile driving thresholds are exceeded, a bubble curtain or other sound attenuation method as described in the National Marine Fisheries Service-approved sound attenuation monitoring plan shall be utilized to reduce sound levels below the criteria described above. If National Marine Fisheries Service sound level criteria are still exceeded with the use of attenuation methods, a National Marine Fisheries Service-approved biological monitor shall be available to conduct surveys before and during pile driving to inspect the work zone and adjacent waters for marine mammals. The monitor shall be present as specified by the National Marine Fisheries Service during impact pile driving and ensure that:
  - The safety zones established in the sound monitoring plan for the protection of marine mammals are maintained.
  - Work activities are halted when a marine mammal enters a safety zone and resumed only after the animal has been gone from the area for a minimum of 15 minutes.

This noise level limit shall be coordinated with vibration limits required under Mitigation Measures M-NO-4a, Construction Vibration Monitoring, M-NO-4b, Vibration Control Measures During Controlled Blasting and Pile Driving, and M-NO-4c, Vibration Control Measures During Use of Vibratory Equipment, to ensure that the lowest of the specified vibration limits is ultimately implemented.

Significance after Mitigation: Less than Significant

Impact BI-5: Operation of the proposed project would not have a substantial adverse effect, either directly or through habitat modification, on marine 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, U.S. Fish and Wildlife Service, or National Marine Fisheries Service. ***(Less than Significant)***

Increased Overwater Shading

With the installation of the proposed recreational dock, there is expected to be a net increase in the area of over-water structures. The shading of the water column and benthic habitat as a result of overwater structure installation has the potential to reduce the quality of fish habitat within the area shaded by the structure. Overwater shading has been demonstrated to reduce the growth rates and establishment of aquatic vegetation, decrease primary productivity, alter predator-prey dynamics, compromise the invertebrate community by changing the species composition, and reduce the overall density of benthic invertebrates.[110,111,112,113]

Within the footprint of the proposed dock, the severity of impacts listed above would be minor. The existing onsite benthic habitat is generally of poor quality given its extended history of adjacency to heavy industrial activity. Additionally, significant portions of the aquatic environment have been severely contaminated by pollutants harmful to aquatic organisms (see Sections 4.J, Hydrology and Water Quality and 4.K, Hazards and Hazardous Materials). Special-status benthic communities, like eelgrass beds, are not present within the study area and therefore would not be impacted by this small amount of increased shading.

However, as it relates to the quality of fish foraging habitat, there is likely to be an impact to the benthic community as rates of primary production and overall invertebrate richness would likely decline within the small area of shading due to the long-term shading effects described above. While this could represent a potential adverse impact, the relatively small size of the proposed overwaters structure, coupled with the already reduced quality of benthic habitat within the project footprint after years of industrial activity, would result in a negligible change from the existing conditions and have a very limited impact on listed marine species.

Section 4.H Wind and Shadow, of this EIR contains a detailed analysis of how implementation of the proposed project, in particular the construction of new buildings, may increase the amount and duration of shading within and adjacent to the project site. For a detailed description of the methodology and results of this analysis see Section 4.H, Wind and Shadow. With respect to the aquatic resources, the impact from increased shadow over portions of the aquatic environment is likely to be minimal. Analysis of increased shadow along the proposed Waterfront Park (adjacent to the bay shoreline) indicate that the park would be in sunlight in the morning year-round and in shadow in the afternoon year-round. However, this is not a significant departure from the existing

110 Helfman, G.S. 1981. The advantage of fishes of hovering in shade. Copeia 2: 392-400.
111 Glasby, T.M. 1999. Effects of shading on subtidal epibiotic assemblages. Journal of Experimental Marine Biology and Ecology, 234: 275-290.
112 Struck, S.D., C.B. Craft, S.W. Broome, M.D. Sanclements, and J.N. Sacco. 2004. Effects of bridge shading on estuarine marsh benthic community structure and function. Environmental Management, 34: 99-111.
113 Stutes, A.L., J. Cebrian, and A.A. Corcoran. 2006. Effects of nutrient enrichment and shading on sediment primary production and metabolism in eutrophic estuaries. Marine Ecology Progress Series, 312: 29-43.

condition as the Unit 3 Power Block currently casts substantial shadow on the central and southern parts of the proposed park. While not directly analyzed in the shadow analysis, the aquatic portion of the project site is further east of proposed building construction than the Waterfront Park. As such, impacts to the aquatic environment from shadow are likely to be less than those predicted at the Waterfront Park. Figure 4.H-8, p. 4.H-30, shows the annual net new shadow compared to existing conditions, and indicates only an occasional increase in shadow at certain times of day over a very small portion of the aquatic environment. As such, any impacts to the aquatic environment from increased shadow would be ***less than significant***.

Increased Vessel Traffic

Implementation of the proposed project would result in increased vessel traffic to and from the proposed dock. However, vessels traveling to and from the dock are not expected to disturb bottom sediments to an extent that it would increase turbidity, as there is little evidence that bottom disturbance and resuspension occurs at significant levels from the type of crafts expected to use the docking facility (e.g., shallow draft vessels).[114] Additionally, all vessels would operate at low speeds within the vicinity of the landings, which should further limit the potential for resuspension of sediment or benthic disturbance.

There is the potential that the vessel traffic would result in increased noise that may startle fish or marine mammals and result in their temporary exclusion from the project area. However, observations by the San Francisco Bay Area Water Emergency Transportation Authority of ferry operations within San Francisco Bay indicate that impacts from vessel traffic on fish are typically minor, localized, and limited to short periods of time during ferry arrival and departure.[115] Under the proposed project, only watercraft of a significantly smaller size than used in ferry operations would utilize the proposed dock. As such any potential impacts from vessel traffic would be reduced those associated from ferry operations and would be ***less than significant***.

Operation of Proposed Stormwater Outfall

As described above in Impact BI-4, under the dual system (preferred) option, collected storm flows would be conveyed through the new system to a new outfall on the east side of the project site near the former Unit 3 Power Block intake. During project operations, any discharge from the new outfall into the San Francisco Bay would be limited to storm events, which generally occur during the rainy season from November to April, and any effects of these discharges on nearshore habitats and associated marine organisms would not be substantially different from existing conditions where stormwater from the eastern portion of the project site currently flows directly to the bay via three stormwater outfalls. Additionally, given the infrequent nature of large storm events, it is unlikely that special-status subtidal resources would be substantially affected by stormwater discharge compared to the level to which they are currently exposed. As discussed above, no eelgrass beds exist within the project site, or within the extended vicinity of the outfall structure, so no impacts to established eelgrass beds or to the few scattered oysters that were observed within

[114] Clarke, D., K.J. Reine, C. Dickerson, C. Alcoba, J. Gallo, B. Wisemiller, and S. Zappala. 2015. Sediment Resuspension by Ship Traffic in Newark Bay, New Jersey. Dredging Operations Technical Support Program – U.S. Army Corps of Engineers. April 2015.

[115] National Marine Fisheries Service (NMFS), Biological Opinion – Downtown San Francisco Ferry Terminal Expansion Project, San Francisco, Ca. Issued June 30, 2014.

the intertidal portion of the project site are expected as a result of stormwater discharges. Therefore, impacts on marine resources associated with operation of the proposed stormwater outfall would be ***less than significant***.

Mitigation: None required.

Impact BI-6: Construction and operation of the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game U.S. Fish and Wildlife Service, or the National Marine Fisheries Service. *(Less than Significant)*

Terrestrial Biological Resources

The project site has been fully developed and no riparian habitat or other sensitive terrestrial natural communities are present on or near the project site. As such, *no impacts* from construction or operation on sensitive terrestrial natural communities would result from implementation of the proposed project.

Marine Biological Resources

Within the San Francisco-Bay Delta region, the National Marine Fisheries Service has identified eelgrass beds (*Zostera marina*) as a habitat area of particular concern. These habitat areas of particular concern are considered high priority areas for conservation, management, or research because they are rare, sensitive, stressed by development, or important to ecosystem function. No eelgrass beds exist within the project study area, so there would be no impact on this sensitive natural community and the fish that reside within such habitat from project construction and operation.[116]

Within the project area, a few scattered oysters are present on the intertidal rock and debris that comprise the existing shoreline. As native oysters occur throughout San Francisco Bay, their presence along the Central Bay basin waterfront is not unexpected. While a few scattered individuals do occur, they are not present in the densities that would constitute a substantial "oyster bed" as observed along portions of the intertidal and subtidal shorelines of Treasure Island, Port of San Francisco, or Richardson Bay. Recent oyster pre-construction surveys conducted along the shoreline at Pier 64 and Pier 70, both of which are very similar in form and habitat quality to the shoreline within the proposed project area, concluded that protection of existing oysters was not warranted.[117] At Pier 64, this survey was performed to evaluate conditions prior to shoreline stabilization, by grading and rip-rap placement, of a similar type to that planned under the proposed project. In addition to the conclusion that existing oysters did not require protection, it was determined for Pier 64 that the post-construction stabilized shoreline would provide greater structural complexity and likely more suitable substrate for successful recolonization by oysters. Given the similarities between the physical structure of the two sites, and the similarities between

[116] Merkel & Associates, San Francisco Bay Eelgrass Inventory; October-November 2014, prepared for the California Department of Transportation and NOAA National Marine Fisheries Service, November 2014.
[117] Tetra Tech, Inc. 2011. Native bivalves survey report, Mission Bay shoreline project. San Francisco, Ca. May 2011.

their respective shoreline enhancements, a similar beneficial outcome can be expected to occur within the project area. Thus, any impact from construction or operation of the proposed project on native oysters would be ***less than significant***.

Mitigation: None required.

Jurisdictional Waters

Impact BI-7: Construction of the proposed project could have a substantial adverse effect on San Francisco Bay through direct removal, filling, hydrological interruption, or other means. ***(Less than Significant with Mitigation)***

The San Francisco Bay is considered a navigable water of the United States and is therefore considered jurisdictional waters of the U.S. regulated by the U.S. Army Corps of Engineers under section 404 of the Clean Water Act up to the high tide line, and under section 10 of the Rivers and Harbors Act up to the mean high water mark. These waters also are regulated by the Regional Water Quality Control Board under section 401 of the Clean Water Act as waters of the state. Under the McAteer-Petris Act, the San Francisco Bay Conservation and Development Commission has jurisdiction over all areas of San Francisco Bay that are subject to tidal action (mean high tide line or up to 5 feet above mean sea level), as well as the shoreline band extending inland for 100 feet from the San Francisco Bay shoreline, saltponds, and managed wetlands. As discussed in the Environmental Setting, wetlands do not occur on the terrestrial or marine portions of the project site, and as Impact BI-6 describes, no habitat areas of particular concern, such as eelgrass beds occur on or adjacent to the project site and would not be impacted by the project. However, portions of the proposed project may occur within Clean Water Act sections 401 and 404, Rivers and Harbors Act section 10, and McAteer-Petris Act jurisdiction.

Fill of San Francisco Bay

The proposed project includes several components that could result in placement of fill within jurisdictional waters of the San Francisco Bay. To address the potential hazard of future sea-level rise in combination with storm and high tide conditions, the proposed project includes physical shoreline improvements consisting of rock slope revetments, berms and bulkheads, and grading elevation inland, some of which would require work below the high tide line and mean high water line. Should a dual sewer and stormwater system be selected instead of the combined scenario (see Chapter 2, Project Description, and Section 4.J, Hydrology, Water Quality, and Sea Level Rise,) then a new stormwater outfall for discharging runoff from the project site would be installed in the vicinity of the existing Unit 3 Power Block outlet structure and below the high tide line and mean high water line. Additionally, the proposed project would include installation of a new 80-foot long and 3-foot wide floating dock. The wharf portion of the dock would require nine 24-inch support piles, six of which would be installed landside (though potentially below the high tide line and within the U.S. Army Corps of Engineers section 404 jurisdiction), and three of which would occur below the mean higher high water line (and within the army corps section 10 jurisdiction). No other project work is planned to occur below the high tide line or mean higher high water line that would affect the bay.

Project activities resulting in the placement of bay fill[118] or other disturbance to jurisdictional waters (i.e., below the high tide line) would require permit approval from the U.S. Army Corps of Engineers, and a water quality certification and/or waste discharge requirements from the Regional Water Quality Control Board. Those projects within the San Francisco Bay or within the shoreline band require a permit from the Bay Conservation and Development Commission. Collectively, these regulatory agencies and the permits and authorizations they issue for the proposed project would require that placement of new fill in jurisdictional waters be avoided or minimized to the maximum extent practicable while still accomplishing the proposed project's purpose, and they would specify an array of measures and performance standards as conditions of project approval to ensure natural resource protection. These permits would require water quality protection measures to avoid and/or minimize temporary impacts from in-water and above-water construction activities that would be implemented in conjunction with water quality protection mitigation measures identified in Section 4.J, Hydrology and Water Quality.

In addition, permanent placement of new fill associated with project implementation (i.e., shoreline improvements, installation of the [optional] new outfall, and floating dock) resulting in the loss of jurisdictional waters in excess of that necessary for normal maintenance may trigger a requirement for compensatory mitigation that will be aimed at restoring or enhancing similar ecological functions and services as those displaced. The types, amounts, and methods of compensatory measures required will differ among the permitting agencies, depending on the specific resources they regulate and the policies and guidelines they implement.

Placement of permanent fill in the San Francisco Bay attributable to the project and resulting in a loss of waters would be a significant impact. Implementation of **Mitigation Measure M-BI-7**, **Compensation for Fill of San Francisco Bay**, would reduce potential project-related impacts on jurisdictional waters to a less-than-significant level through restoration or enhancement of the San Francisco Bay shoreline or intertidal/subtidal habitat along the waterfront as compensation for the permanent fill[119] of San Francisco Bay by the project. Therefore, the construction impacts of the project on jurisdictional waters would be ***less than significant with mitigation***.

> **Mitigation Measure M-BI-7: Compensation for Fill of Jurisdictional Waters**
>
> The project sponsor shall provide compensatory mitigation for placement of fill associated with maintenance or installation of new structures in the San Francisco Bay as further determined by the regulatory agencies with authority over the bay during the permitting process.

[118] Under CWA section 404, a permit is required for the 'discharge of dredged or fill material' into waters of the United States. Fill material is any substance placed (also described as discharged) in waters of the United States where the material has the effect of either replacing any portion of a water of the United States with dry land or changing the bottom elevation of any portion of a water. Examples of fill material include rock, sand, soil, clay, plastics, construction debris, wood chips, overburden from mining or other excavation activities, and materials used to create any structure or infrastructure (such as outfall pipes and/or bulkheads under the proposed project) in waters of the United States. [USACE SPN-2003-01 and 33 Code of Federal Regulations 323.2(5) (e)(1)]

[119] The quantity of permanent fill in the San Francisco Bay attributable to the project and resulting in the loss of waters (e.g., from placement of new fill or fill in exceedance of the minimum threshold for repair and replacement of existing infrastructure), if any, will be determined during the permitting process and through project review by regulatory agencies with authority over the San Francisco Bay.

Compensation may include onsite or offsite shoreline improvements or intertidal/subtidal habitat enhancements along San Francisco's waterfront through removal of chemically treated wood material (e.g., pilings, decking, etc.) by pulling, cutting, or breaking off piles at least 1 foot below mudline or removal of other unengineered debris (e.g., concrete-filled drums or large pieces of concrete).

Significance after Mitigation: Less than Significant

Impact BI-8: Operation of the proposed project would not have a substantial adverse effect on state and federal waters through direct removal, filling, hydrological interruption, or other means. ***(Less than Significant)***

Maintenance Dredging for Vessel Access

In order to ensure continued vessel access to the floating dock east of the Unit 3 Power Block outfall, periodic maintenance dredging may be required to offset sedimentation rates along the shoreline. Dredging would result in the removal of sediment and/or soft substrate foraging habitat. During dredging, benthic invertebrates would also be removed with the substrate. This could temporarily reduce the diversity and productivity of the benthic habitat in the dredged area. Recovery of benthic infaunal and epifaunal communities following dredging is controlled by many physical and ecological factors, including: the areal extent of dredging; the operational method of dredging; the timing of the dredging relative to natural recruitment; the species composition of adjacent undisturbed sediments; the sediment composition after dredging; and other factors.

Benthic communities living in fine mobile deposits, such as occur in most estuaries, are characterized by populations that are well adapted to rapid recolonization of deposits that are subject to frequent disturbance.[120] Recolonization of dredged areas is usually by opportunistic species characterized by the early stages of secondary succession, and is followed by an increased diversity of species that are longer-lived and slower growing as the succession progresses. Removal of sediment and resulting disturbed habitat effects are considered temporary as the benthic community is expected to recover or re-colonize over a short period of time. In soft substrate areas of the San Francisco Bay, dredging-induced substrate disturbance is considered small in scale compared to naturally occurring physical events, such as storm-generated waves and the deposition of sediment from riverine sources.[121]

Periodic maintenance dredging would disturb bottom sediments, which would increase turbidity, disturb benthic habitat and associated communities of organisms living in or on the mud bottom, and affect essential fish habitat. This disturbance could result in the temporary loss or reduction of habitat suitable for fish foraging for sensitive species, such as steelhead, Chinook salmon, green sturgeon, longfin smelt as well as fish managed under the Magnuson-Stevens Act. Pacific herring,

120 Pittman B.T., A survey of inbenthic macrofauna at a South San Francisco Bay salt marsh. San Jose, CA: San Jose State University, *http://scholarworks.sjsu.edu/cgi/viewcontent.cgi?article=2394&context=etd_theses*, 1996.

121 MEC Analytical Systems, Inc. & U.S. Army Corps of Engineer Research and Development Center, Spatial characterization of suspended sediment plumes during dredging operations through acoustic monitoring, Technical report to the USACE, San Francisco District, San Francisco, CA, 2004.

a commercially important species, could also be affected if spawning had occurred in the area just before or during maintenance dredging activities.

Resuspension of Sediments During Dredging

The extent to which dredging operations would affect aquatic species depends on numerous factors such as type of equipment, tide, currents, and wind conditions during the dredging operation. Clamshell dredging operations results in sediment resuspension when the bucket contacts the sediment bottom and from the spillage of sediment during barge loading.[122] Suspended sediments in the water column, over a long period of time, have the potential to affect fish by disrupting normal feeding behavior, reducing growth rates, increasing stress levels, and reducing respiratory functions.

Increased suspended solids can also affect aquatic organisms by reducing dissolved oxygen levels and light transmission, and when the sediment in the suspended solids resettles, it could have the potential to smother aquatic habitats and organisms. Changes in light transmission have the potential to limit photosynthesis and reduce foraging abilities for organisms that rely on visual signals for feeding (e.g., salmonids and several species of birds).[123] Substantially depressed oxygen levels (i.e., below 5.0 mg/l) may cause respiratory stress to aquatic life, and levels below 3.0 mg/l may cause mortality.

However, recent studies by the San Francisco Estuary Institute determined that the short term effects of dredging activities on sensitive fish species are typically minor.[124] Two local projects monitored dredging events within the bay and confirmed the general characteristics of plumes and the resulting suspended sediments.[125] The MEC 2004 study conducted for the Port of Oakland reported a composite acoustic signature of a plume that was patchily distributed both vertically and horizontally over an area approximately 738 wide and 1,722 feet long, with the plume concentrated around the dredging location. The data were collected during different surveys at different times and then combined to form the composite image. Total suspended solids concentrations above ambient were detected up to 1,200 feet both up- and down-current from the source. In general, significantly elevated total suspended solids concentrations greater than 225 mg/l were detected up to 750 feet from the source.[126] Typically, plumes are stirred and mixed by tidal currents, and conditions become indistinguishable from background within a flood-ebb tide cycle (slightly less than 13 hours).

122 Nightengale, B., C.A. Simenstad, Jr., Dredging Activities: Marine Issues. Seattle, WA 98105: Washington State Transportation Center, University of Seattle, 2001.

123 Anchor Environmental, Literature Review of Effects of Resuspended Sediments Due to Dredging Operations. Prepared for Los Angeles Contaminated Sediments Task Force, Los Angeles, California, 2003.

124 San Francisco Estuary Institute (SFEI), Effects of Short-term Water Quality Impacts Due to Dredging and Disposal on Sensitive Fish Species in San Francisco Bay, SFEI Contribution 560, San Francisco Estuary Institute, Oakland, California. 2008.

125 MEC Analytical Systems, Inc. & U.S. Army Corps of Engineer Research and Development Center, Spatial characterization of suspended sediment plumes during dredging operations through acoustic monitoring, Technical report to the USACE, San Francisco District, San Francisco, CA, 2004.

126 Ibid.

Resuspended sediment levels caused by natural phenomena such as floods, storms, large tides, and winds are often higher and of longer duration than those caused by dredging, especially in lakes and bays. Previous studies have demonstrated that marine organisms are accustomed to sediment resuspension levels greater than those generated by dredging.[127,128]

Dredging activities from the proposed project would be expected to occur at a much smaller scale to those described for the Oakland Harbor. The Central San Francisco Bay is the deepest sub-embayment in the San Francisco Bay estuary, and has the strongest tidal currents within the estuary.[129] Due to the project site's close proximity to the deep waters of the Central San Francisco Bay, currents are expected to be strong and function to dissipate turbidity plumes within hours, if not faster. Similarly, oxygen level depression resulting from project site construction activities are not expected to remain depressed for long periods due to rapid tidal flushing, and releases of anoxic (oxygen-poor) sediment would occur for relatively short time periods. Therefore, elevated levels of turbidity fed by sediment resuspension associated with dredging activities would be short-term and localized, and the long-term effects to fish and other aquatic life would be less than significant.

Mobilization of Chemicals of Concern

The suspension of sediment during dredging activity has the potential to release constituents of concern within the water column. Once released, these constituents have the potential to degrade water quality and present a potential exposure pathway to aquatic organisms. An impact related to increased levels of suspended sediment can be the increased bioavailability of contaminants. Organic contaminants, such as polycyclic aromatic hydrocarbons, are often bound to the finer silt and clay fractions of sediments. The silt and clay fractions are typically found in the surface layer of San Francisco Bay sediments and can mobilize easily into the water column and stay in solution longer than the larger and heavier sand fraction of the sediments. Metals, such as lead, are often more closely associated with the heavier and larger sediment fraction, but depending on the metal, can be associated with the fines as well. While the particulates are in suspension, the contaminants become more available to biota and can become dissolved into the water itself.

Investigations by PG&E have detected elevated polycyclic aromatic hydrocarbon concentrations in the sediments offshore of the project site within a 16-acre area known as the Offshore Sediment area (see Figure 4.K-1). PG&E has committed to providing remediation to this area by dredging and removing a portion of the contaminated sediments and placing an engineered erosion protection cap to isolate the remaining sediments. For a more detailed discussion of this proposed sediment remediation action, see Section 4.K Hazards and Hazardous Materials. Any future maintenance dredging under the proposed project would be conducted in a manner consistent

127 Douglas M.C. and Sternberg, R.W., Field measurements of the fluid and sediment-dynamic environment of a benthic deposit feeder. Journal of Marine Research. Vol. 46, November 1988.

128 Wilbur, D.H., D.G. Clarke, Biological Effects of Suspended Sediments: A Review of Suspended Sediment Impacts on Fish and Shellfish with relation to Dredging activities in Estuaries. N.A. Journal of Fisheries Management. Vol. 21, Iss. 4, 2001.

129 Chin J.L., D.L. Woodrow, M. McGann, F.L. Wong, T. Fregoso, and B.E. Jaffe, Estuarine sedimentation, sediment character, and foraminiferal distribution in central San Francisco Bay, CA, 2010. USGS open-file report 2010-1130, 58 pages plus data tables and GIS data.

with this remediation effort and the risk management plan that has been approved by the Regional Water Quality Control Board.

As described above under "Regulatory Framework," p. 4.I-24, any future maintenance dredging would be required to be conducted in a manner consistent with the guidance set forth under the Long Term Management Strategy Management Plan. This plan was developed by a collective of federal, state, and regional stakeholders; it establishes a cooperative permitting framework for dredging, dredged material disposal, and the development of beneficial reuse sites for dredge material. Compliance with the long-term management strategy would ensure the environmentally responsible future maintenance of navigation channels, to and from the proposed docking facilities, through consultation with the National Oceanic and Atmospheric Association-National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and other resource agencies. With the goal of protecting aquatic resources during dredging operations the long term management strategy establishes environmental work windows, which significantly reduce the likelihood of impacts from dredging on special-status aquatic species. Importantly, the long-term management strategy institutes a programmatic methodology for initiating consultation with the requisite regulatory permitting agencies that govern dredging operation within San Francisco Bay.

Therefore, the proposed adherence with the long-term management strategy and any applicable regional board-approved risk management plan would ensure that any future maintenance dredging would comply with the established environmental agency regulatory requirements for dredging. And as such, future maintenance dredging conducted as part of project operations would not have a substantial adverse effect on the San Francisco Bay, and this impact would be ***less than significant.***

Mitigation: None required.

Wildlife Movement

Impact BI-9: The proposed project could interfere substantially with the movement of native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. *(Less than Significant with Mitigation)*

Terrestrial Biological Resources

As discussed above under Impact BI-1, construction of the proposed project could affect birds attempting to nest within the project site directly through nest destruction or mortality, and indirectly through an increase in the ambient noise environment that might disrupt breeding behavior, discourage nesting, or cause nest abandonment. This would be a significant impact. Implementation of **Mitigation Measure M-BI-1 Nesting Bird Protection Measures**, and project compliance with the California Fish and Game Code, are expected to reduce potential construction-related effects on birds nesting within the project site and surrounding vicinity such that this impact would be ***less-than-significant with mitigation***.

Through compliance with City-required bird-safe building design standards (San Francisco Planning Code section 139 [Standards for Bird-Safe Buildings]), operation of the proposed project would not adversely affect resident or migratory birds through an increased risk of collision with new buildings or structures presenting location-related or feature-related hazards; potential collision hazards for resident and migrating birds as a result of the proposed project would be *less-than-significant*.

No terrestrial wildlife movement corridors or established native wildlife nursery sites occur on the project site.

Mitigation Measure M-BI-1: Nesting Bird Protection Measures (see Impact BI-1, above)

Significance after Mitigation: Less than Significant

Marine Biological Resources

Central San Francisco Bay serves as a migration corridor for special-status anadromous fish between the Pacific Ocean and spawning habitat, primarily within the Sacramento and San Joaquin River watersheds, but also in a handful of tributaries to San Francisco Bay. Those that use the San Francisco Bay as a migration corridor to the Central Valley watersheds rarely stray south of the San Francisco-Bay Bridge. And while Central California Coast steelhead spawn in a few southern San Francisco Bay tributaries, no spawning streams occur within close proximity to the project site. If special-status anadromous fish species were to occur within the vicinity of the project site their presence would only be temporary, as they move between spawning habitat and the Pacific Ocean, and would likely occur outside the window in which pile driving or other in-water work would occur.

Pacific herring are known to breed on in-water structures and utilize this habitat along the San Francisco waterfront. A lack of suitable spawning habitat within the project study area makes their occurrence less likely relative to other areas along the waterfront where spawning habitat is abundant. Of all the special-status fish species, longfin smelt have the greatest potential to occur within the water adjacent to the project site. However, because longfin smelt distribution within the San Francisco Bay-Delta is driven by fluctuations in salinity, they are unlikely to occur in large numbers near the project site outside of late summer.

In general, the presence of marine mammals in San Francisco Bay is related to distribution and presence of prey species and foraging habitat. Harbor seals and sea lions use various intertidal substrates that are exposed at low to medium tide levels for resting and breeding. California sea lions are noted for using anthropogenic structures such as floating docks, piers, and buoys to haul out of the water to rest. Marine mammal haul out locations do not occur in the project study area, as such the presence of marine mammals is likely to be confined to a few rafting or foraging individuals and not the large numbers seen elsewhere within San Francisco Bay.

In addition to the low likelihood of occurrence of special-status marine species, the limited scope of proposed in-water work makes a substantial impact to marine movement corridors unlikely.

Nevertheless, the implementation of **Mitigation Measure M-BI-4, Fish and Marine Mammal Protection during Pile Driving**, would ensure that any construction-related impacts to marine movement corridors and established native wildlife nursery sites would be ***less than significant with mitigation***.

> **Mitigation Measure M-BI-4: Fish and Marine Mammal Protection during Pile Driving** (see Impact BI-4, above)
>
> **Significance after Mitigation:** Less than Significant

Plans and Policies

Impact BI-10: The proposed project would not conflict with any local policies or ordinances protecting biological resources; and would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. ***(Less than Significant)***

No adopted habitat conservation plan or natural community conservation plan covers the project terrestrial or marine areas, and there are no protected significant or landmark trees on the project site. Twenty street trees occur along Illinois Street between 22nd Street and Humboldt Street and along 23rd Street between Illinois Street and (the proposed) Georgia Street. The seven Japanese blueberry trees along 23rd Street would be retained under the project. The thirteen street trees located on Illinois Street consisting of cork oak, cajeput, and ginko would be removed under the project. Compliance with the City's tree protection policy for street trees would ensure that street trees to be retained under the project would be adequately protected during construction and those identified for removal would be approved by the San Francisco Department of Public Works; thus, the proposed project would have a less than significant impact on protected street trees. No other conflict with adopted local, regional, or state provisions is expected with project implementation. Thus, impacts related to conflict with policies or plans protecting biological resources would be ***less than significant***.

> **Mitigation:** None required.

Cumulative Impacts

Impact C-BI-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, could result in a cumulatively considerable contribution to significant impacts on biological resources. ***(Less than Significant with Mitigation)***

The geographic scope of potential cumulative impacts on biological resources encompasses the species occurrences, habitats, and sensitive natural communities within the project study area, as well as biologically linked areas sharing the adjacent waterfront of San Francisco Bay.

The following current and reasonably foreseeable projects may result in impacts to biological resources generally located within 0.5-mile of the project site on or near San Francisco's eastern waterfront and are considered in this analysis of the proposed project's cumulative impacts. Future San Francisco waterfront projects, when viewed individually, may not have a significant impact on biological resources, however, their cumulative impact may reach a different level of significance. Thus, the cumulative impact of all proximate projects, including the proposed project, are analyzed below. Table 4.A-2 in Section 4.A.6, Approach to Cumulative Impact Analysis, provides a description of projects considered in the cumulative analysis, and Figure 4.A-1: Cumulative Projects in the Project Vicinity, p. 4.A-15, depicts their locations.

- **Waterfront Projects**
  - PG&E remediation activities in Offshore Sediment Area
  - Golden State Warriors Event Center and Mixed Use Development
  - Crane Cove Park Redevelopment
  - Seawall Lot 337 / Pier 48 Mission Rock Development
  - Mariposa Pump Station Interim Repairs
  - San Francisco Port BAE Lease Renewal
  - Mission Bay Ferry Landing and Taxi Landing Project
  - SF Port Re-Tenanting of Pier 70 Shipyard
  - Pier 70 Mixed-Use District

- **Landside development near the project site**
  - 20th Street Historic Core at Pier 70
  - 2177 Third Street
  - 2051 Third Street / 650 Illinois Street

All of the cumulative projects listed above are currently undergoing, or have undergone, environmental review, and consistent with CEQA requirements, environmental impacts have been avoided or minimized to the extent feasible. Some of these projects are expected to have mostly temporary impacts on biological resources during the construction phase including the: Seawall Lot 337/Pier 48 Mission Rock Development, Mission Bay Ferry Landing, Golden State Warriors Event Center and Mixed-Use Development, Bayfront Park, and Pier 70 Mixed-Use District. Other projects, such as the future Crane Cove Park, which would provide an open space area, would include elements likely to result in long term beneficial effects on biological resources. Such elements would include improved foraging opportunities and nesting or roosting habitat for terrestrial wildlife, and improved shoreline diversity and subtidal and intertidal habitat associated with removal of non-engineered debris and pier replacement or refurbishing.

Terrestrial Biological Resources

The proposed project would have a limited effect on terrestrial biological resources that inhabit the project site and surrounding vicinity primarily because the existing built environment within the study area offers marginal habitat value to resident species. Short-term construction impacts identified above in Impact BI-1 and Impact BI-3, include potential disturbance to nesting birds and roosting bats. Development of the other reasonably foreseeable projects on San Francisco's eastern

waterfront are likely to have limited effects on nesting birds and roosting bats, similar to the proposed project. This is due to the similarity of developed upland habitat conditions in these areas, and the related limited opportunity for nesting birds and roosting bats within this geographic area. Further, the majority of these proximate project sites are located inland of the eastern waterfront among increasingly dense, existing development, and thus, offer less habitat for such terrestrial resources than the project site. In addition, all the projects listed above would be required to comply with applicable regulatory requirements protecting these biological resources and project-specific mitigation measures (where applicable) similar to those of the proposed project.

As with the proposed project, many of the projects listed above would generate noise and visual disturbance above pre-project conditions during construction and some of the projects would require tree and/or vegetation removal that could cause nest failure or abandonment if active bird nests are present. These combined effects, of the proposed project and the proximate projects listed above that offer similar nesting opportunity for birds, would result in a cumulatively significant impact. The proposed project's incremental contribution, without mitigation, would result from increased noise and visual disturbance during construction, vegetation removal, and building demolition if active bird nests are present and adversely affected by such activities, which is cumulatively considerable. Implementation of the project-specific **Mitigation Measure M-BI-1** (**Nesting Bird Protection Measures**) would reduce the project's contribution to cumulative impacts on nesting birds by conducting initial project disturbance (e.g., vegetation removal, building demolition, or asphalt removal) and other activities that might impact nesting birds (e.g., pile driving or controlled rock fragmentation) outside of nesting season, performing pre-construction nesting bird surveys prior to the start of construction or demolition activities during nesting season (where feasible), and establishing protective no-disturbance buffers around active nests identified within the project site or monitoring active nests during construction. These protective requirements would avoid and minimize the project's contribution to significant cumulative impacts to nesting birds such that the cumulative impacts would be ***less than significant with mitigation***.

Long-term operational impacts discussed under Impact BI-2 include a less than significant increased risk of bird collisions with project buildings or features, because the project would be designed to minimize avian risks resulting from collision with structures. The other cumulative projects would also be required to comply with the protection measures specified in the City's *Standards for Bird-Safe Buildings* as part of project building design which would ensure that any long-term cumulative impact to birds resulting from collisions would be less than significant.

The proposed project and many of the cumulative projects identified above would include demolition and/or construction activities that generate noise and increase human activity above pre-project conditions during construction. These activities could have a substantial adverse effect on special-status bats and/or maternal roosts, if present, which in combination would be a significant cumulative impact. The proposed project's incremental contribution, without mitigation, would result from disturbance associated with increased noise, human activity, and building demolition and construction if special-status bats or maternal roosts are present and adversely affected by such activities, which is cumulatively considerable. Implementation of **Mitigation Measure M-BI-3** (**Avoidance and Minimization Measures for Bats**) would reduce the project's contribution to cumulative impacts on special-status and roosting bats by preferentially

removing structures when bats are active, establishing no-disturbance buffers around roost sites, removing structures containing active bat roosts under the oversight of a qualified biologist and in a manner that encourages the bats to safely leave the roost. Other cumulative projects that may potentially impact roosting bats would likely be required to implement similar measures such that bats would be avoided during sensitive periods to minimize direct impacts and bats would be safely removed, when necessary, during appropriate non-sensitive periods. Thus, the project's contribution to cumulative impacts to roosting bats would be ***less than significant with mitigation***.

In summary, while adverse effects to nesting birds and special-status bats or maternal roosts could occur under the project or the cumulative projects, after mitigation and through compliance with state and federal regulations protecting nesting birds, special-status bats and maternal roosts, the cumulative impact on these terrestrial biological resources would be less than significant with mitigation. Through compliance with the City's *Standards for Bird-Safe Buildings* the cumulative impacts to birds related to collisions would be less than significant.

Mitigation Measure M-BI-1: Nesting Bird Protection Measures (see Impact BI-1, above)

Mitigation Measure M-BI-3: Avoidance and Minimization Measures for Bats (see Impact BI-3, above)

Marine Biological Resources

For marine resources, the geographic scope for cumulative impacts includes the project marine study area, the Mission Bay neighborhood, Mission Bay, Piers 70 and 71, Warm Water Cove, and the surrounding waters of Central San Francisco Bay.

Regional projects that involve in-water construction, and that, in combination with the proposed project, have the potential to result in a significant cumulative impact on aquatic resources include the PG&E remediation offshore of the project site, the Crane Cove Park Redevelopment, the Mission Bay Ferry Landing and Water Taxi Landing project, and the Pier 70 Mixed-Use District project. The in-water construction activities that would occur under the proposed project and the cumulative projects listed above would include the remediation of harmful chemicals within bay sediment, construction of docking facilities for vessel traffic, and the enhancement and restoration of dilapidated shoreline habitat for public use.

As such, the potential impacts described above for the proposed project are similar to those that can be expected to occur under implementation of other nearby projects. Potential cumulative impacts would be the same as the construction impacts identified under Impact BI-4, Impact BI-6, and Impact BI-7, including temporary increases in underwater noise, alterations to existing subtidal and intertidal habitat, and impacts to water quality or placement of fill in the San Francisco Bay have the potential to result in significant impacts to marine resources. These combined effects, of the proposed project and the nearby projects listed above, would result in a significant cumulative impact. Both the proposed project, and other waterfront projects located in the immediate vicinity, involve in-water pile installation, the placement of fill in bay waters, and maintenance dredging to facilitate vessel access. In combination, these construction activities would result in a cumulatively significant impact on marine biological resources. The proposed

project's incremental contribution, without mitigation, would result from increased underwater noise generated during pile installation the placement of fill and increased overwater shading resulting from the proposed dock construction, and impacts to water quality if maintenance dredging is required.

Project–specific mitigation measures (such as **Mitigation Measures M-BI-4**, **Fish and Marine Mammal Protection during Pile Driving,** and **M-BI-7**, **Compensation for Fill of Jurisdictional Waters),** and other best management practices designed to protect special-status fish, marine mammals, and jurisdictional waters would reduce the project's contribution to cumulative impacts to a less-than-significant level. Therefore, cumulative impacts resulting from in-water work, and the cumulative impact on marine resources associated with construction would be ***less than significant with mitigation***.

Operational impacts identified under Impacts BI-5 and BI-8, including temporary increases in underwater noise and water quality impairment as a result of increased vessel traffic would have very limited impacts on marine resources due to the localized and limited scale at which they would occur, resulting in a less than significant impact. The cumulative projects would have similar localized impacts; however, these projects are geographically far enough from one another that their local noise and water quality effects would not cumulatively degrade in-water conditions for biological resources. Similarly, any vessel traffic would presumably be staggered in a manner that the impacts would not compound upon each other. Therefore, the combined operational effects of the proposed project and the nearby projects listed above is not considered cumulatively significant. That is, cumulative operational impacts on marine resources would be ***less than significant.***

> **Mitigation Measures M-BI-4: Fish and Marine Mammal Protection during Pile Driving** (see Impact BI-4, above)
>
> **Mitigation Measure M-BI-7: Compensation for Fill of Jurisdictional Waters** (see Impact BI-7, above)
>
> **Significance after Mitigation:** Less than Significant

4.J Hydrology and Water Quality

4.J.1 Introduction

Section 4.J, Hydrology and Water Quality, addresses the hydrology and water quality impacts that could result from construction and operation of the proposed Potrero Power Station Mixed-Use Development project. The environmental setting below describes the existing hydrology and water quality in the project area with a focus on San Francisco Bay and the San Francisco bayside waterfront area. Stormwater management in San Francisco and potential areas of flooding and tsunami inundation are also identified. The setting section is followed by a discussion of the federal, state, and local regulatory framework applicable to hydrology and water quality aspects of construction and implementation of the proposed project. Potential impacts that could result from construction and operation of the proposed project are then discussed, along with regulatory requirements and features included in the proposed project that would ensure water quality impacts would be less than significant.

Existing conditions and potential impacts associated with water supply, stormwater, and wastewater treatment are addressed in the Appendix B, Initial Study, under Utilities and Service Systems with respect to the potential to exceed the capacity of existing systems. Existing conditions and potential impacts associated with water quality impacts on fish and other marine species are addressed in EIR Section 4.I, Biological Resources.

4.J.2 Environmental Setting

Climate

The Bay Area has a Mediterranean climate, with cool, dry summers and mild, wet winters. The mean annual precipitation in San Francisco is approximately 24 inches per year with most of the rainfall occurring between November and March.[1] The average annual temperature in San Francisco is 57.3 degrees Fahrenheit, with the minimum average monthly temperature occurring in December and January (46 degrees Fahrenheit) and maximum average monthly temperature occurring during September (70 degrees Fahrenheit).

San Francisco Bay

The project site is adjacent to San Francisco Bay, which connects the Pacific Ocean to the west with San Pablo Bay, Suisun Bay, and the Sacramento-San Joaquin Delta to the north and east. The San Francisco Bay is an estuarine environment that receives saltwater inputs from the Pacific Ocean through the Golden Gate, and freshwater inputs from the Sacramento-San Joaquin Delta to the northeast, as well as various other tributary rivers and creeks located around San Francisco Bay.

[1] U.S. Climate Data, San Francisco, *http://www.usclimatedata.com/climate/san-francisco/california/united-states/usca0987*, accessed February 24, 2018.

Stormwater Management

Stormwater on the eastern portion of the project site currently drains to a separate stormwater system that flows directly to Lower San Francisco Bay via three valve-controlled stormwater outfalls. Stormwater from the remainder of the project site is diverted to the City's combined sewer system operated by the San Francisco Public Utilities Commission (SFPUC). This combined sewer system collects and transports both wastewater and stormwater runoff in the same set of pipes, and the combined flows are all treated at the same treatment facilities. The City's combined sewer system and wastewater flows relevant to the water quality analysis are described below.

SFPUC Combined Sewer System

The City's combined sewer system is roughly divided into two major drainages: the Bayside and the Westside drainage basins. The Bayside drainage basin, which includes the project site, covers the eastern side of San Francisco and consists of three distinct sewer discharge basins and their associated urban watersheds: North Shore (North Shore watershed), Central (Channel watershed in its entirety and a portion of the Islais Creek watershed), and South (remainder of the Islais Creek watershed and the entirety of Yosemite and Sunnydale watersheds). The watersheds are shown on **Figure 4.J-1, San Francisco Drainage Basins**, and the project site is located in the Islais Creek watershed. Combined stormwater and wastewater flows from the Bayside drainage basin are conveyed for treatment to the Southeast Water Pollution Control Plant (Southeast Plant), located on Phelps Street between Jerrold and Evans avenues.

The Southeast Plant includes facilities to provide both primary and secondary treatment of the combined wastewater and stormwater flows. Primary treatment is the first stage in treatment and includes physical methods to remove floating and settleable solids from raw flows. Secondary treatment at the Southeast Plant involves aeration with oxygen to enhance the biological breakdown of the combined flows, followed by secondary clarification for further solids removal. All discharges from the Southeast Plant, whether treated to a primary or secondary level, are disinfected using sodium hypochlorite and then dechlorinated using sodium bisulfite to remove any chlorine residual prior to discharge.

During dry weather (typically May through September), the wastewater flows consist mainly of industrial wastewater and sanitary sewage (wastewater from toilet flushing and other sanitary conveniences), collectively referred to as wastewater. The annual average wastewater flow during dry weather is 51.4 million gallons per day (mgd).[2] The average dry-weather design flow capacity of the Southeast Plant is 84.5 mgd; therefore, the existing dry-weather flows are about 61 percent of the treatment capacity, and all dry-weather wastewater flow is treated to a secondary level at the Southeast Plant. During dry weather, the treated wastewater is discharged to San Francisco Bay through the deep water outfall at Pier 80, located immediately to the north of the Islais Creek Channel.

[2] San Francisco Water Power Sewer, *Southeast Water Pollution Control Plant and Bayside Wet Weather Facilities 2017 Annual Self-Monitoring Report*, February 1, 2018.

SOURCE: City of San Francisco, 2011

Potrero Power Station Mixed-Use Development Project

Figure 4.J-1
San Francisco Drainage Basins

During wet weather (generally October through April), the combined sewer system collects large volumes of stormwater runoff in addition to wastewater, and together, they are referred to as wet-weather flows. Depending on the amount of rainfall, wet-weather flows are treated to varying levels before being discharged to San Francisco Bay. Up to 150 mgd of wet-weather flows receive secondary treatment at the Southeast Plant. The Southeast Plant can also treat up to an additional 100 mgd to a primary treatment standard plus disinfection, for a total wet-weather treatment capacity of 250 mgd. Treated wet-weather discharges of up to 250 mgd from the Southeast Plant occur through the Pier 80 outfall directly to San Francisco Bay or through the Quint Street outfall to Islais Creek Channel on the south bank of Islais Creek. Only wastewater treated to a secondary level is discharged at the Quint Street outfall.

Up to an additional 150 mgd of wet-weather flows receive primary treatment plus disinfection at the North Point Wet Weather Facility, located on the northern side of the city at 111 Bay Street. This facility operates only during wet weather. The treatment process at this facility consists of using bar screens to remove large objects such as garbage; sedimentation to allow solids to settle out; skimming to remove floatables; disinfection with sodium hypochlorite; and dechlorination using sodium bisulfite to remove any chlorine residual before discharge. Primary treated effluent from this facility is discharged through four deep water outfalls, approximately 800 feet from the San Francisco Bay shore and 18 feet below mean lower low water.[3] Two of the deep water outfalls terminate at the end of Pier 33, and two terminate at the end of Pier 35 on the northeastern San Francisco Bay shore.

The City's combined sewer system includes underground concrete storage and transport boxes that, during wet weather, temporarily retain the combined stormwater and wastewater flows that exceed the total 400-mgd capacity of the Southeast Plant and the North Point Wet Weather Facility for later treatment. When rainfall intensity results in combined flows that exceed the total 400-mgd capacity of the Southeast Plant and North Point Wet Weather Facility, and the 125-million-gallon capacity of the storage and transport structures, the excess flows are discharged through 29 combined sewer discharge structures located along the City's bayside waterfront from the Marina Green to Candlestick Point. Discharges from these structures receive flow-through treatment, which is equivalent to primary treatment, to remove settleable solids and floatable materials. Wet-weather flows are intermittent throughout the rainy season, and combined sewer discharge events vary in nature and duration, depending largely on the intensity of individual rainstorms.

All discharges from the City's combined sewer system to San Francisco Bay, through either the outfalls or the combined sewer discharge structures, are operated in compliance with the federal Clean Water Act and the state Porter-Cologne Water Quality Control Act through the National Pollutant Discharge Elimination System (NPDES) permit for discharges from the Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities, and Wastewater Collection System (referred to as the Bayside NPDES Permit).

The SFPUC Wastewater Enterprise manages the City's combined sewer collection, treatment, and discharge system, and is currently implementing the Sewer System Improvement Program, a city-wide program to repair and seismically upgrade aging sewer infrastructure. Prepared with

[3] Mean Lower Low Water is the average height of the lowest tide recorded each day of a period of 19 years.

extensive input from the public, the Sewer System Improvement Program focuses on providing reliable, efficient, sustainable, and environmentally acceptable operation and management of the combined sewer system and addresses both critical near-term needs and long-term issues. The plan incorporates adaptations for climate change.

Islais Creek Watershed

The proposed project is located almost entirely within the Islais Creek watershed. Islais Creek is the largest watershed on San Francisco's bayside, covering 5,523 acres that extend from near the southern city limits to the north and then east to the Islais Creek Channel. West of Highway 101, the land uses in the watershed are primarily residential, while to the east, it is heavily industrial, including the container terminals to the north and south of Islais Creek Channel. Along the north side of the project site, there is a small area (approximately 0.2 acre) that drains to the 20th Street sub-basin.

Stormwater runoff from the western half of the project site currently drains to the combined sewer system and exits the site in three locations:

- at 22nd Street via sheet flow to a 12-inch diameter combined sewer line that connects with the 18-inch diameter combined sewer line that flows southward beneath Illinois Street (this pipe increases to 24 inches in diameter at Humboldt Street);
- at Humboldt Street via a lateral into the 27-inch diameter combined sewer line that flows southward beneath Illinois Street; and
- at 23rd Street via a combined sewer line that connects with the 27-inch diameter combined sewer line that flows southward beneath Illinois Street (this 27-inch diameter pipe becomes a 48-inch diameter pipe just south of 23rd Street).

All of the sanitary sewage from the project site is also pumped to the 27-inch diameter combined sewer line beneath Illinois Street via the combined sewer line beneath 23rd Street.

The 24-inch diameter Illinois Street sewer line turns west at 23rd Street to Third Street where it continues south towards Cesar Chavez Street. The 27-inch diameter Illinois Street sewer line continues south along Illinois Street eventually also arriving at Third and Cesar Chavez streets. At Third and Cesar Chavez streets, there is a flow split such that dry weather flows from both lines continue directly to the Southeast Plant and wet weather flows can be diverted to the Islais Creek transport/storage box during periods of high flow.

Completed in 1997, the Islais Creek transport/storage box volume is 45 million gallons, including associated sewer storage capacity. In dry weather, flows from the Islais Creek drainage area are intercepted by the Southeast Plant lift station and pumped directly to the Southeast Plant. In wet weather, excess flows are diverted to the Islais Creek transport/storage box, which then convey the flows to the Flynn Pump Station (previously the Rankin Street Pump Station). The Flynn Pump Station has a maximum capacity of 110 million gallons per day and pumps flows to the Southeast Plant for treatment.

When the capacity of the Flynn Pump Station is exceeded during wet weather, a portion of the excess wet-weather flows are discharged to Islais Creek via five combined sewer discharge

structures or to Mission Creek via six combined sewer discharge structures.[4] A portion of the flows are also directed to the Mariposa Street combined sewer discharge structure which discharges to the Central Basin of Lower San Francisco Bay. Consistent with other discharges from combined sewer discharge structures, these discharges receive the equivalent of primary treatment to remove settleable solids and floatable materials prior to discharge.

The Islais Creek collection and conveyance facilities are designed to meet a long-term average of no more than 10 combined sewer discharges per year.[5] Although the system was designed and constructed based on meeting this long-term average, it is understood that some years are wetter than others. Therefore, the Bayside NPDES Permit allows for the 10- combined sewer discharge annual average to be exceeded in any particular year as long as the long-term average is maintained at the appropriate level. The provisions of the Bayside NPDES Permit are discussed below under "State Regulations," p. 4.J-21.

20th Street Sub-Basin

The project site is located to the south of the 20th Street sub-basin of the Islais Creek watershed. This basin is approximately bounded by Illinois Street on the west, 19th Street on the north, 22nd Street and the Potrero Power Plant on the south, and San Francisco Bay on the east. When the capacity of the 20th Street Pump Station is exceeded during wet weather, a portion of the excess wet-weather flows is stored in a 54-inch sewer line and a 42-inch-diameter sewer line. Flows in excess of the pump station and sewer line storage capacity are discharged to the Central Basin of San Francisco Bay via the 20th and 22nd streets combined sewer discharge structures located along the bay shoreline. Consistent with other discharges from combined sewer discharge structures, these discharges receive the equivalent of primary treatment to remove settleable solids and floatable materials prior to discharge. The 20th Street sub-basin collection and conveyance facilities are designed to meet a long-term average of no more than 10 combined sewer discharges per year. Consistent with other discharges from combined sewer discharge structures, these discharges receive the equivalent of primary treatment to remove settleable solids and floatable materials prior to discharge.

Previous Wastewater and Stormwater Discharges

The power plant previously discharged wastewater and some stormwater to Lower San Francisco Bay in accordance with NPDES permits from the Regional Water Quality Control Board and State Water Resources Control Board.[6] Wastewater discharges occurred via the Unit 3 outfall discussed in Chapter 2, Project Description. The power plant also discharged some stormwater via the Unit 3 outfall as well as two shoreline outfalls permitted under the state water board's general industrial

[4] San Francisco Bay Regional Water Quality Control Board, National Pollutant Discharge Elimination System (NPDES) Permit No. CA0037664, Order No.R2-2013-0029, for City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities and Wastewater Collection System, adopted August 19, 2013.

[5] SFPUC, *Task 500, Technical Memorandum No. 509, Combined Sewer Discharges, Final Draft*. December 2010.

[6] California Regional Water Quality Control Board, San Francisco Bay Region, Order Number: R2-2006-0032, NPDES Permit No. CA0005657, Reissuing Waste Discharge Requirements for: Mirant Power, LLC, Potrero Power Plant, San Francisco, San Francisco County, May 10, 2006.

stormwater permit applicable in 2006. The existing stormwater drainage system does have manually operated valve controls to preclude unwanted discharges to the bay, however the existing stormwater system does not include any stormwater controls to reduce the rate or volume of stormwater runoff or treat the runoff.[7]

Existing Flood Zones

Some low-lying areas along San Francisco's bay shoreline are subject to flooding during extreme high tides, storm surge, and waves, although these occurrences are relatively rare in San Francisco compared to areas prone to hurricanes or other major coastal storms or to developed areas near or below sea level. In 2008, the City and County of San Francisco adopted interim flood maps depicting the 100-year flood hazard zone along the City's bay shoreline. The shoreline portions of the project site are located within a 100-year flood zone identified on the City's 2008 Interim Flood Hazard Maps.[8] The flood elevation is measured in North American Vertical Datum of 1988 (NAVD88), and ranges from 11 to 12 feet at the project site.[9] Flooding in these areas would have the potential to damage buildings and infrastructure, and structures built in these areas could potentially impede or redirect flood flows.

Flooding as a Result of Sea Level Rise

Flooding conditions at the project site and along San Francisco's bay shoreline would be exacerbated with projected sea level rise over the remainder of the century due to climate change. This section discusses the factors contributing to coastal flooding and the potential for increased flooding in the future as a result of sea level rise, assuming that no flood protection measures are implemented.

Factors Contributing to Coastal Flooding

Coastal areas are vulnerable to periodic flooding due to extreme tides, storm surge, storm waves, and El Niño storm events. These conditions can result in many effects, including flooding of low-lying areas, including roads, boardwalks, and waterfront promenades; storm drain backup; wave damage to coastal structures; and erosion of natural shorelines. Rising sea level due to climate change has the potential to increase the frequency, severity, and extent of flooding as a result of these conditions, each of which is described below.

Extreme Tides

Diurnal (meaning, twice daily) high tides along San Francisco's bay shoreline typically range from approximately 5 to 7 feet NAVD88, and annual maximum tides may exceed 7 feet NAVD88.[10] The twice yearly extreme high and low tides are called king tides. These occur each year during the winter and summer when the earth, moon, and sun are aligned, and the winter event may be

7 Carlson, Barbee & Gibson, Inc., *Draft Infrastructure Plan, Potrero Power Station, San Francisco, California*, February 28, 2018.
8 City and County of San Francisco, *San Francisco Interim Floodplain Map, East, Final Draft*, July 8, 2008.
9 Federal Emergency Management Agency (FEMA), San Francisco Bay Area Coastal Study, Increased Flooding Scenarios, San Francisco County, FIRM Database, Preliminary, November 12, 2015.
10 SFPUC, *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum,* June 2014

amplified by weather. A portion of the Embarcadero Promenade near Pier 14 and the Marina area in San Francisco experiences inundation under king tide conditions.

Storm Surge

Storm surge occurs when persistent high winds and changes in air pressure elevate bay water levels above normal tide levels, which can raise the water level near the shoreline by several feet and may persist for several days. Along San Francisco's bay shoreline, storm surge typically raises the surface water elevation by 0.5 foot to as much as 3.0 feet during major winter storms.[11] The degree of storm surge depends on the severity of the storm as well as tidal levels at the time of the storm. Storm surge is characterized using a return period that represents the expected frequency of a storm event occurring based on historical information. One-year storm surge is expected to occur each year, while 100-year storm surge (which represents more extreme conditions) has a 1 percent chance of occurring in any year.

Storm Waves

Waves and wave run-up primarily affect a narrow band of land along the shoreline where wave energy can damage structures and overtop both natural embankments and shoreline protection structures such as seawalls and levees. The influence of waves diminishes inland as wave energy dissipates. In addition, the Pacific Ocean waves, which are generally larger than those originating in San Francisco Bay, are substantially dampened along San Francisco Bay shoreline due to transformation processes within San Francisco Bay. Along the San Francisco Bay shoreline, storm waves typically raise the surface water elevation by 1 to 4 feet during major winter storms several times a year.[12]

El Niño Winter Storms

During El Niño events,[13] atmospheric and oceanographic conditions in the Pacific Ocean bring warm, higher waters to the Bay Area and may produce severe winter conditions that bring intense rainfall and storm conditions to the Bay Area. Tides are often elevated 0.5 to 1.0 foot above normal along the coast and in San Francisco Bay for months at a time, and additional storm surge and wind effects during storm events can elevate water levels even further. El Niño conditions prevailed in 1977-1978, 1982-1983, 1997-1998, 2009-2010,[14] and 2015-2016.[15]

Sea Level Rise

Sea levels are rising globally due to climate change, and they are expected to continue to rise at an accelerating rate for the foreseeable future. The sea level at the San Francisco tidal gage has risen

11 SFPUC, *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum,* June 2014.
12 Ibid.
13 El Niño–Southern Oscillation is a natural oceanic-atmospheric cycle. El Niño conditions are defined by prolonged warming in the Pacific Ocean sea surface temperatures. Typically, this happens at irregular intervals of 2 to 7 years, and can last anywhere from 9 months to 2 years.
14 SFPUC, *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum.* June 2014.
15 National Oceanic and Atmospheric Administration (NOAA), Climate.gov, April 2016 El Nino/La Nina update: What goes up…, *https://www.climate.gov/news-features/blogs/enso/april-2016-el-ni%C3%B1ola-ni%C3%B1a-update-what-goes-%E2%80%A6*, accessed February 24, 2018.

approximately 0.08 inch per year since 1897, resulting in about 0.8 foot of sea level rise between that time and 2017.[16] The National Research Council's 2012 report, Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future (the National Research Council Report) provides a scientific review of sea level rise for the West Coast and provides the most recent regional sea level rise predictions for 2030, 2050, and 2100, relative to the year 2000 sea level.[17] In this report, the NRC projects that sea levels in the Bay Area will rise 11 inches by 2050 and 36 inches by 2100, as presented in **Table 4.J-1**, **National Research Council Sea Level Rise Estimates for San Francisco Bay Relative to the Year 2000**. As presented in the National Research Council Report, these sea level rise projections represent likely sea level rise values based on the current understanding of global climate change and assuming a moderate level of greenhouse gas emissions[18] and extrapolation of continued accelerating land ice melt patterns.

TABLE 4.J-1
NATIONAL RESEARCH COUNCIL SEA LEVEL RISE ESTIMATES FOR SAN FRANCISCO BAY RELATIVE TO THE YEAR 2000

Year	Projection (inches)	Upper Range (inches)
2030	6	12
2050	11	24
2100	36	66

SOURCE: National Research Council, 2012

The National Research Council Report also includes ranges of sea level rise that could occur based on different estimates of greenhouse gas emissions and ice melt patterns. The extreme upper limit of the ranges represents unlikely but possible levels of sea level rise that are based on very high greenhouse gas emissions scenarios and significant ice melt that is not currently anticipated but could occur. Assuming the maximum level of greenhouse gas emissions and ice melt, the National Research Council anticipates that sea levels in the Bay Area could rise up to 24 inches by 2050 and 66 inches by 2100 as presented in Table 4.J-1.

These estimates represent the long-term increase in Mean Sea Level and the associated average daily high tide conditions (represented by Mean Higher High Water[19], or MHHW) that could result

16 NOAA, Mean Sea Level Trend 9414290 San Francisco, California, *https://tidesandcurrents.noaa.gov//sltrends_station.shtml?stnid=9414290*, accessed February 24, 2018.

17 National Research Council, *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Washington, DC: The National Academies Press, 2012, *http://www.nap.edu/catalog.php?record_id=13389*, accessed February 24, 2018.

18 Future emissions of greenhouse gases depend on a collection of human decisions at local, regional, national, and international levels as well as potential unknown technological developments. For this reason, future changes in greenhouse gas emissions cannot be accurately estimated, and a range of emissions levels is considered in the NRC Report. Estimates of sea level rise relative to thermal expansion of the oceans were formulated using the mid-level, or moderate level, of predicted changes in greenhouse gas emissions (from a combination of fossil and non-fossil fuels), as well as an assumption of high economic growth; this represents scenario "A1B" as described by the Intergovernmental Panel on Climate Change (IPCC).

19 Mean Higher High Water (MHHW) is the average height of the highest tide recorded each day of a period of 19 years.

from sea level rise; they do not take into account extreme tides, storm surge, storm waves, or El Niño storm events, all of which can result in water levels that are temporarily higher than MHHW as discussed above.

In 2015 the California Coastal Commission adopted the National Research Council Report as the best science currently available in its Sea Level Rise Policy Guidance. The California Coastal Commission guidance emphasizes the importance of regularly updating sea level rise projections as the science continues to advance.[20] The San Francisco Planning Department currently considers the National Research Council Report to be the best science currently available on sea level rise affecting San Francisco for both CEQA and planning purposes.

In March 2013, the California Ocean Protection Council updated its 2010 statewide sea level rise guidance to adopt the National Research Council Report as the current, best available science on sea level rise for California.[21] Later, in April 2017, a Working Group of the Ocean Protection Council's Science Advisory Team released a report synthesizing the state of sea level rise science entitled Rising Seas in California: An Update on Sea-Level Science (Rising Seas Report). The Rising Seas Report was prepared and peer reviewed by some of California's and the nation's foremost experts in coastal processes, climate and sea-level rise science, observational and modeling science, the science of extremes, and decision making under uncertainty. Sea level rise projections provided in the Rising Seas Report are based on probabilistic modeling using low and high greenhouse gas emission estimates through the year 2150.

The Ocean Protection Council considers the Rising Seas Report, along with other authoritative peer-reviewed science to be the currently best available science to base future planning and investing decisions for California, as long as the other peer reviewed reports are not less precautionary than the foundation set forth by the Rising Seas Report. In March 2018, the council published an update to its sea level rise guidance titled State of California Sea-Level Rise Guidance: 2018 Update.[22] The Rising Seas Report provides the scientific foundation for the updated guidance. The updated guidance states that decisions about which sea-level rise projections to select should be based on many factors, including project location, lifespan of the project, the degree of sea-level rise exposure and associated impacts, the adaptive capacity of the project, and the degree of risk tolerance. A step-wise process for project planning is provided.

The updated guidance provides sea level rise values for *low risk aversion*, *medium-high risk aversion*, and *extreme risk aversion*. The extreme risk aversion values are recommended for high consequence projects with little to no adaptive capacity. Medium-high risk aversion values are a precautionary projection to be used for less adaptive, more vulnerable projects. Low risk aversion values are

[20] California Coastal Commission, *Sea Level Rise Policy Guidance, Interpretive Guidelines for Addressing Sea Level Rise in Local Coastal Programs and Coastal Development Permits,* Unanimously Adopted August 12, 2015, *http://documents.coastal.ca.gov/assets/slr/guidance/August2015/0_Full_Adopted_Sea_Level_Rise_Policy_Guidance.pdf,* accessed February 24, 2018.

[21] *California Climate Action Team, State of California Sea-Level Rise Guidance Document.* Developed by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), with science support provided by the Ocean Protection Council's Science Advisory Team and the California Ocean Science Trust, March 2013 Update, *http://www.opc.ca.gov/webmaster/ftp/pdf/docs/2013_SLR_Guidance_Update_FINAL1.pdf*, accessed June 17, 2018.

[22] California Natural Resources Agency, 2018. *State of California Sea-Level Rise Guidance: 2018 Update. http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A_OPC_SLR_Guidance-rd3.pdf,* accessed June 17, 2018.

considered the likely range of sea level rise that could occur and these projections are appropriate for adaptive and/or low consequence projects. The proposed project is considered an adaptive project because the proposed seawall and rock slope revetment along the shoreline can be raised in the future if necessary in the case that sea level rise exceeds projections. Therefore, the low risk aversion values are appropriate for project design.

The Ocean Protection Council provides two estimates of sea level rise beyond 2050 based on low and high global emission scenarios. These estimates for low risk aversion projects are shown in **Table 4.J-2**, **Ocean Protection Council Sea Level Rise Estimates for San Francisco Bay Relative to the Year 2000**. For the years 2050 and 2100, the high emissions projections are 23 and 41 inches, less than the upper range of sea level rise estimated by the National Resources Council of 24 and 66 inches.

TABLE 4.J-2
OCEAN PROTECTION COUNCIL SEA LEVEL RISE ESTIMATES FOR SAN FRANCISCO BAY RELATIVE TO THE YEAR 2000

Year	Low Emissions Projection, inches	High Emissions Projection, inches
2030	-	6
2050	-	13
2070	18	23
2100	29	41

SOURCE: Ocean Protection Council, 2018

Sea Level Rise Inundation Mapping

The SFPUC, as part of the planning for its Sewer System Improvement Program, developed a series of maps published in 2014 that represent areas of inundation along both the San Francisco Bay and Pacific Ocean shorelines of San Francisco. The Port of San Francisco updated the maps in 2016 to include its piers and wharves.[23] These maps use a 1-meter horizontal grid resolution based on the 2010/2011 California Coastal Mapping Program LiDAR. The inundation maps use data from the Federal Emergency Management Agency's California Coastal Mapping and Analysis Project, which includes detailed coastal engineering analyses and mapping of the San Francisco Bay shoreline.

The inundation maps evaluate scenarios that represent the National Research Council projections of sea level rise in combination with the effects of storm surge. They represent permanent inundation that could occur as a result of total water level rises (over and above year 2000 MHHW) based on daily tidal fluctuations. Each scenario also addresses temporary inundation that could occur from extreme tides and from 1-year, 2-year, 5-year, 25-year, 50-year, and 100-year storm surge. Flooding as a result of storm surge would occur on a temporary basis, during and immediately after a storm event or extreme tide.

[23] AECOM, *Port of San Francisco Sea Level Rise Inundation Mapping Technical Memorandum,* March 2016.

The scenarios listed below represent San Francisco Bay water elevations that could occur by the year 2050 and the year 2100, based on the National Research Council's *projected* levels of sea level rise and considering a 100-year storm surge.

- 12 inches above year 2000 MHHW (representative of National Research Council's projected sea level rise by 2050);
- 36 inches above year 2000 MHHW (representative of National Research Council's projected sea level rise by 2100);
- 52 inches above year 2000 MHHW (representative of National Research Council's projected sea level rise by the year 2050 in combination with a 100-year storm surge); and
- 77 inches above year 2000 MHHW (representative of National Research Council's projected sea level rise by the year 2100 in combination with a 100-year storm surge).

The following scenarios represent the maximum San Francisco Bay water elevations that could occur by the year 2100, based on the National Research Council's *upper range* of sea level rise and considering 100-year storm surge.

- 66 inches above year 2000 MHHW (representative of National Research Council's upper range of sea level rise by 2100); and
- 107 inches above year 2000 MHHW (representative of National Research Council's upper range of sea level rise by the year 2100 in combination with a 100-year storm surge).

The Port of San Francisco cautions that its maps represent a "do-nothing scenario," in which no site-specific measures are taken to prevent future flooding and no area-wide measures such as waterfront protection structures are constructed. In the event that the City undertakes area-wide measures to protect against inundation in the future, the mapping would need to be revised to reflect the modified inundation areas with implementation of these measures. In addition, because the Port sea level rise maps are based on 2010/2011 topographic mapping, they do not account for the construction of shoreline improvements that would occur under the proposed project to prevent future flooding due to sea level rise.

MHHW near the project site is at an elevation of 6.4 feet NAVD88.[24] **Table 4.J-3**, **Water Elevations Associated with Sea Level Rise Projections**, presents water elevations near the project site associated with each of the sea level rise scenarios discussed above, based on the year 2000 MHHW elevation. The Port inundation maps indicate that under existing conditions, only the immediate waterfront portion of the project site would be inundated with 12 inches of sea level rise, which is expected by 2050, even when the effects of 100-year storm surge are considered. Similarly, the site would not be subject to daily tidal inundation with 36 inches of sea level rise, except for the immediate waterfront. When the effects of 100-year storm surge are considered in addition to 36 inches of sea level rise, the flood level would be approximately 12.8 feet NAVD88 and larger portions of the project site waterfront would be inundated. When the effects of 100-year storm surge are considered in addition to 66 inches of sea level, the flood level would be approximately

24 SFPUC, *Climate Stressors and Impact: Bayside Sea Level Rise Mapping, Final Technical Memorandum.* June 2014.

15.4 feet NAVD88. Flooding would extend approximately 250 feet inland from the bay shoreline at the project site.

TABLE 4.J-3
WATER ELEVATIONS ASSOCIATED WITH SEA LEVEL RISE PROJECTIONS

Sea Level Rise Scenario	Elevation (feet, NAVD88)
2000 MHHW with no sea level rise	6.4
2000 MHHW plus 100-year storm surge	9.8
2000 MHHW plus 12 inches of sea level rise	7.4
2000 MHHW plus 12 inches of sea level rise and 100-year storm surge	10.7
2000 MHHW plus 36 inches of sea level rise	9.4
2000 MHHW plus 36 inches of sea level rise and 100-year storm surge	12.8
2000 MHHW plus 66 inches of sea level rise (upper range)	11.9
2000 MHHW plus 66 inches of sea level rise and 100-year storm surge (upper range)	15.4

NOTES:
MHHW = Mean Higher High Water. This is the higher of each day's two high tides averaged over time.

SOURCE: Port of San Francisco, 2016; Orion Environmental Associates, 2018

Planning for Sea Level Rise in San Francisco

The City has convened an inter-agency Climate Adaptation Working Group to identify ways to ensure that it is prepared to adapt to effects of sea level rise.[25] Participating agencies include the Department of the Environment, the SFPUC, the Planning Department, the City Administrator's Office, the Port, San Francisco International Airport, San Francisco Public Works, the San Francisco Municipal Transportation Agency, the San Francisco Department of Public Health, and the San Francisco Recreation and Park Department. The working group is focusing its effort on the City's most imminent adaptation concerns, including sea level rise along Ocean Beach and shores, flooding from storm surge and extreme rain events, an increased likelihood of extreme heat, and decreased fog that supports local ecosystems such as redwoods. It is working on ways to improve the existing coastal flood protection infrastructure in time to prevent significant flooding impacts from sea level rise. The working group will establish requirements to address proper flood insurance for structures in low-lying areas, flood-resilient construction of new development within inundation areas, and a low carbon footprint for new development. It is also assessing the use of natural solutions, such as wetlands, to protect the shoreline.

Former San Francisco Mayor Edwin M. Lee also established two interdepartmental committees to manage the City's efforts on addressing sea level rise: the Sea Level Rise Coordinating and Sea Level Rise Technical committees. The Sea Level Rise Coordinating Committee, established in February 2015, is a director-level committee co-chaired by the Director of Citywide Planning at the Planning Department and the City Engineer and Deputy Director at Public Works. Sea Level Rise

[25] Adaptation Clearinghouse, SF Adapt (San Francisco Climate Adaptation Working Group, *http://www.adaptationclearinghouse.org/organizations/sf-adapt-san-francisco-climate-adaptation-working-group.html*, accessed February 24, 2018.

Coordinating Committee members also include the Chief Resiliency Officer and senior staff from the Mayor's Office, the City Administrator's Office, the airport, the Port, the SFPUC, the transportation agency, the Department of Building Inspection, the Office of Community Investment and Infrastructure, the Office of Economic and Workforce Development, and the Capital Planning Committee.

Guidance for Incorporating Sea Level Rise into Capital Planning

On September 22, 2014, the City's Capital Planning Committee adopted the Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation, which was prepared by the Sea Level Rise Coordinating Committee. The guidance document has been revised to simplify the analysis of specific sea level rise scenarios and clarify how to select the appropriate scenario for design and planning purposes. The revised document also provides a methodology for determining the design tide for use in project design and planning, and was adopted by the Capital Planning Committee on December 14, 2015.[26]

San Francisco Sea Level Rise Action Plan

In March 2016, the mayor's Sea Level Rise Coordinating Committee released the San Francisco Sea Level Rise Action Plan,[27] with lead City staffing by the Planning Department and Public Works, along with other City departments and a consultant team. The Action Plan is intended to guide City departments in their understanding of and adaptation to the impacts of sea level rise, and it also identifies what long-term sea level rise means for San Francisco's residents, visitors, economy, and waterfront.

The Action Plan establishes an overarching vision, goals, and a set of guiding principles for sea level rise planning; summarizes current climate science, relevant policies and regulations, and vulnerability and risk assessments conducted to date; identifies data gaps and establishes a framework for further assessment, adaptation planning, and implementation; and provides the foundation and guidance to develop a citywide Sea Level Rise Adaptation Plan.

The Action Plan is the first step in the development of the Citywide Sea Level Rise Adaptation Plan, expected to be completed by the end of 2020, which will incorporate the adaptation strategies identified in the Action Plan and help prioritize investments to best improve climate resilience while protecting socioeconomic and environmental value. The Adaptation Plan will also identify potential funding sources, governance structures, and implementation timelines.

---

26 City and County of San Francisco Sea Level Rise Committee, *Guidance for Incorporating Sea Level Rise into Capital Planning in San Francisco: Assessing Vulnerability and Risk to Support Adaptation*, December 14, 2015, *http://onesanfrancisco.org/sites/default/files/inline-files/Guidance-for-Incorporating-Sea-Level-Rise-into-Capital-Planning1.pdf*, accessed February 28, 2018.

27 City and County of San Francisco, Sea Level Rise Action Plan, March 2016. Available online at *http://default.sfplanning.org/plans-and-programs/planning-for-the-city/sea-level-rise/160309_SLRAP_Final_ED.pdf*, accessed February 24, 2018.

Planning for Climate Change under the SFPUC Sewer Improvement Program

The SFPUC is also addressing sea level rise as part of its Sewer System Improvement Program, and is conducting a detailed analysis of the potential for new and existing combined sewer infrastructure to be affected by sea level rise.[28] Accordingly, all new facilities will be built using a climate change criterion so the combined sewer system will be better able to respond to rising sea levels. Rising sea levels and storm surge could potentially inundate the combined sewer system and exacerbate existing flooding that can result from backups of the sewer system in some areas of San Francisco. Rising sea levels and storm surge can also cause new flooding. To address these issues, the SFPUC is also evaluating alternatives such as the installation of backflow preventers on the combined sewer discharge structures to restrict the intrusion of bay water into the combined sewer system.

Tsunami and Seiche

Tsunamis (seismic sea waves) are long-period waves that are typically caused by underwater seismic disturbances, volcanic eruptions, or submerged landslides that typically travel at speeds of up to 500 miles per hour. Tsunami wave heights are typically up to 3 feet in the open water and can be barely perceptible to watercraft. The wave height may increase in height to 30 feet or more when they reach land, potentially causing large amounts of damage.[29] A *seiche* (a temporary disturbance in the water level) is caused by oscillation of the surface of an enclosed body of water such as the San Francisco Bay due to an earthquake or large wind event. Seiches can result in long-period waves that cause run-up or overtopping of adjacent landmasses, similar to tsunami run-up.

San Francisco may experience distant-, regional-, and local-source tsunamis. The Tsunami Annex to San Francisco's Emergency Response Plan defines a distant-source tsunami as one generated by an earthquake or other source event located over 1,000 kilometers (621 miles) from San Francisco.[30] Travel times for distant-source tsunamis vary from 4 to 15 hours. A regional-source tsunami results from a source less than 621 miles from San Francisco and has a travel time of 1 to 2 hours. A near-source tsunami results from a source less than 62 miles from San Francisco and could reach San Francisco within 10 to 15 minutes. The primary tsunami threat to the San Francisco Bay Area is from a distant-source earthquake originating from a subduction fault such as the Aleutian-Alaska-Cascadia Subduction Zone.[31] Approximately 94 percent of the 54 historic tsunamis to reach San Francisco were caused by distant source events and resulted in maximum wave heights of 4 feet in San Francisco. A near-source tsunami caused by a Bay Area earthquake is not seen as a major threat to the City because the majority of Northern California's faults are strike-slip and are less likely to cause damaging tsunamis.[32]

---

28 SFPUC, *Bayside Drainage Basin Urban Watershed Opportunities, Final Draft Technical Memorandum*, July 2014.

29 City and County of San Francisco, *Emergency Response Plan, an Element of the CCSF Emergency Management Program, Tsunami Annex*, August 2016.

30 Ibid.

31 Subduction zones are plate tectonic boundaries where two plates converge, and one plate is thrust beneath the other. This process results in geohazards, such as earthquakes and volcanoes.

32 Strike-slip faults are vertical (or nearly vertical) fractures where the blocks of earth move mostly horizontally past one another.

In 2009, the California Geological Survey, California Emergency Management Agency, and the Tsunami Research Center at the University of California completed the state's official tsunami inundation maps. This mapping indicates that the majority of the project site is located in an area identified for potential inundation in the event of a tsunami or seiche based on existing site grades.[33] However, the map presents a worst case scenario based on over 50 local and distant tsunami sources. Future tsunami events may not produce inundation throughout the full hazard area shown on the 2009 map. Conversely, it is possible that actual tsunami inundation could exceed that shown on the map in a major tsunami event.

A 2008 study conducted in support of the Tsunami Annex to San Francisco's Emergency Response Plan used probabilistic hazard modeling, and estimated that San Francisco may experience a 3-foot distant-source tsunami once every 50 to 60 years, and a 9-foot tsunami every 426 years. In the project vicinity, the maximum elevation of a potential wave from a local source tsunami is 6.3 feet NAVD88 and the maximum elevation of a potential wave from a distant-source tsunami is 10.3 feet NAVD88 based on this modeling.[34]

Water Quality

As described below under "Clean Water Act Section 303(d) and Total Maximum Daily Loads," p. 4.J-18 all states must present the United States Environmental Protection Agency (U.S. EPA) with a list of impaired water bodies, defined as those water bodies that do not meet water quality standards. Lower San Francisco Bay, the Central Basin of Lower San Francisco Bay, and Islais Creekare all listed as impaired water bodies as described below.

Lower San Francisco Bay

The proposed project is located adjacent to Lower San Francisco Bay, which extends from approximately the Bay Bridge on the north to the Dumbarton Bridge on the south. The Regional Water Quality Control Board has listed Lower San Francisco Bay as an impaired water body for the following pollutants: chlordane, dichloro-diphenyl-trichloroethane (DDT), dieldrin, dioxins, furan compounds, mercury, polychlorinated biphenyls (PCBs), invasive species, and trash.[35]

Central Basin of Lower San Francisco Bay

As discussed above, discharges from the 20th Street sub-basin and from the Mariposa Street combined sewer discharge structure are discharged to the Central Basin of Lower San Francisco

[33] California Emergency Management Agency, California Geological Survey, University of Southern California, *Tsunami Inundation Map for Emergency Planning, San Francisco North Quadrangle/San Francisco South Quadrangle (San Francisco Bay)*, June 15, 2009, *http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanFrancisco/Documents/Tsunami_Inundation_SouthSFNorthSF_SFBay_SanFrancisco.pdf*, accessed February 24, 2018.

[34] City and County of San Francisco, *Emergency Response Plan, an Element of the CCSF Emergency Management Program, Tsunami Annex*, August 2016. Note that mean sea level is at an elevation of 3.31 feet NAVD88 near the project site. The elevations reported in the tsunami annex are reported in feet above mean sea level. These elevations were converted from mean sea level to NAVD88 by adding 3.31 feet.

[35] State Water Resources Control Board, 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) — Statewide, *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*, accessed February 24, 2018.

Bay. The regional board has listed the Central Basin as an impaired water body for the following pollutants: chlordane, DDT, dieldrin, dioxins, furan compounds, mercury, and invasive species.[36]

Islais Creek

As discussed above, the project site is located in the Islais Creek watershed of the City's combined sewer system. During wet weather, a portion of the excess wet-weather flows is discharged to Islais Creek via five combined sewer discharge structures. The regional board has listed Islais Creek as an impaired water body for ammonia and hydrogen sulfide.[37] The sediments of Islais Creek are listed for the pesticides chlordane and dieldrin as well as polynuclear aromatic hydrocarbons and toxicity.

Groundwater Resources

The project site is underlain by the San Francisco Downtown Groundwater Basin, one of five groundwater basins in the eastern part of San Francisco. The groundwater basin is composed of shallow, unconsolidated sediments underlain by less permeable bedrock and is separated from the surrounding groundwater basins by bedrock ridges.[38] Bedrock outcrops form much of the northeastern and southern basin boundaries. In general, groundwater flow is towards the northeast, following the topography. Groundwater within the San Francisco Downtown Basin is known to contain elevated concentrations of nitrates, chloride, boron, and total dissolved solids. Historically, groundwater quality in the San Francisco Downtown Groundwater Basin has been affected by a number of fuel leak cases, and groundwater in this basin is considered non-potable. This groundwater basin is not used as a drinking water supply, and there are no plans for development of this basin for groundwater production; the only groundwater extracted from this basin is for dewatering purposes.

Trash in Waterways

Trash is of concern for San Francisco Bay because Lower San Francisco Bay is listed as an impaired water body under section 303(d) of the Clean Water Act for trash. Aquatic debris threatens sensitive ecosystems and has been documented to kill or harm wildlife species.[39] The debris also interferes with navigation; degrades natural habitats; costs millions of dollars in property damage and lost revenue from tourism and commercial fishing activities; and is a threat to human health and safety. Most aquatic debris comes from land-based sources including littering, legal and illegal dumping, a lack of or poor waste management practices and recycling capacity, stormwater discharges, animal interference with garbage, and extreme natural events. The growing quantity of single-use plastic packaging contributes substantially to the amount of trash transported to waterways. Plastic in the marine environment also breaks into smaller and smaller pieces and it is eaten—often with

[36] State Water Resources Control Board, 2010 Integrated Report (Clean Water Act Section 303(d) List/305(b) Report) — Statewide, *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*, accessed February 24, 2018.
[37] State Water Resources Control Board, 2010 Integrated Report (Clean Water Act Section 303(d) List / 305(b) Report) — Statewide, *http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml*, accessed February 24, 2018.
[38] California Department of Water Resources. California's Groundwater, Bulletin 118, February 27, 2004.
[39] National Resources Defense Council, *NRDC News Brief, Waste in our Water: The Annual Cost to California Communities of Reducing Litter That Pollutes our Waterways,* August 2013.

fatal consequences—by fish, turtles, birds, and marine mammals. As discussed under "Inland Surface Waters, Enclosed Bays, and Estuaries Plan," p. 4.J-26, below. the State Water Resources Control Board has adopted an amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Referred to as the Trash Amendment, this amendment prohibits the presence of trash in inland surface waters, enclosed bays, estuaries, and along shorelines in amounts that adversely affect beneficial uses or cause nuisance.

4.J.3 Regulatory Framework

Federal Regulations

Clean Water Act

In 1972, the Clean Water Act established the basic structure for regulating discharges of pollutants into the waters of the United States and gave the U.S. EPA the authority to implement pollution control programs. The Clean Water Act sets water quality standards for contaminants in surface waters. The statute incorporates a variety of regulatory and non-regulatory tools to reduce direct pollutant discharges into waterways, to finance municipal wastewater treatment facilities, and to manage polluted runoff. The U.S. EPA has delegated responsibility for implementation of portions of the Clean Water Act, including water quality control planning and programs in California, to the State Water Resources Control Board and the nine regional boards. Water quality standards applicable to the proposed project are listed in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan), discussed further below under "State Regulations" p. 4.J-21.

Clean Water Act Section 303(d) and Total Maximum Daily Loads

In accordance with section 303(d) of the Clean Water Act, states must present the U.S. EPA with a list of impaired water bodies, defined as those water bodies that do not meet water quality standards. The Clean Water Act requires the development of total maximum daily loads[40] to improve the water quality of impaired water bodies. Implementation of this program in the project area is conducted by the Regional Water Quality Control Board and is discussed below under "State Regulations" p. 4.J-21.

Clean Water Act Section 401—Water Quality Certification

Section 401 of the Clean Water Act 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 (see below). Under section 401 of the Clean Water Act, 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.

[40] A Total Maximum Daily Load is a regulatory term in the U.S. Clean Water Act that describes a plan for restoring impaired waters. The Total Maximum Daily Load identifies the maximum amount of a pollutant that a body of water can receive while still meeting water quality standards.

Clean Water Act Section 402—NPDES Permits

Section 402 of the Clean Water Act authorizes the U.S. EPA to establish a nationwide surface water discharge permit program for municipal and industrial point sources known as the NPDES program. Under section 402, the regional board has set standard conditions for each permittee in the Bay Area, including effluent limitation and monitoring programs. Discharges of stormwater and wastewater from the proposed project would be subject to NPDES permits issued to the City that are described below under "State Regulations" p. 4.J-21.

Clean Water Act Section 404 – Dredging or Filling of Navigable Waters of the U.S.

Under section 404 of the Clean Water Act, a Department of the Army permit must be obtained from the U.S. Army Corps of Engineers (Corps) for the discharge of dredged or fill material into Waters of the United States, including wetlands. The discharge of dredged or fill material typically means adding into waters of the U.S. materials such as concrete, dirt, rock, pilings, or side cast material for the purpose of replacing an aquatic area with dry land. Activities typically regulated under section 404 include the use of construction equipment such as bulldozers, and the leveling or grading of sites where jurisdictional waters occur. Construction activities conducted in the bay below the high tide line[41] at an elevation of 7.5 feet NAVD88 would be subject to Clean Water Act section 404.[42]

The Corps reviews applications for permits in accordance with section 404 guidelines, which have been established by the Corps and U.S. EPA. To issue a permit under section 404, the Corps must ensure that any discharge will not violate the state's water quality standards. Therefore, in California, the proponent of any activity that may result in a discharge to surface Waters of the United States must obtain water quality certification or a waiver of certification from the regional board (pursuant to section 401 of the Clean Water Act). The project sponsor would be required to obtain a permit from the Corps under Clean Water Act section 404 to conduct any work below the high tide line.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act of 1899 prohibits work affecting the course, location, conditions, or capacity of navigable waters of the United States without a permit from the Corps. Navigable waters under the act are those subject to the ebb and flow of the tide and/or are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce (Title 33 Code of Federal Regulations section 3294). Examples of activities requiring a permit from the Corps are the construction of any structure in or over any navigable water; excavation or deposition of materials in such waters; and various types of work performed in such waters, including placement of fill and stream channelization. Construction activities conducted in the bay below the mean high water line at an elevation of 6.0 feet NAVD88 would be subject to Section 10 of the Rivers and Harbors Act.[43] The project sponsor would be required to obtain a

41 The high tide line is the maximum height reached by a rising tide. In the absence of actual data, the high tide line may be determined by physical markings such as a line of oil or scum along the shoreline or a more or less continuous deposit of fine shell or debris on a shoreline or berm.
42 WRA, *Permitting Approach for the Potrero Power Plant Redevelopment Project*, December 15, 2017.
43 Ibid.

permit under section 10 of the Rivers and Harbors Act from the Corps to conduct any work within its jurisdiction.

Federal Combined Sewer Overflow Control Policy

In 1994, the U.S. EPA adopted the Combined Sewer Overflow Control Policy,[44] which became part of the Clean Water Act in December 2000. This policy establishes a consistent national approach for controlling discharges from combined sewers to the nation's waters. Using the NPDES permit program, the permittee is required to implement the following nine minimum controls that constitute the technology-based requirements of the Clean Water Act and can reduce the frequency of combined sewer discharges and their effects on receiving water quality.

1. Conduct proper operation and regular maintenance programs for the combined sewer system and combined sewer discharge structures
2. Maximize the use of the collection system for storage
3. Review and modify pretreatment programs to minimize the effect of non-domestic discharges to the collection system
4. Maximize flow to the Southeast Plant and North Point Wet Weather Facility for treatment
5. Prohibit combined sewer discharges during dry weather
6. Control solids and floatable materials in combined sewer discharges
7. Develop and implement a pollution prevention program focused on reducing the effect of combined sewer discharges on receiving waters
8. Notify the public of combined sewer discharges
9. Monitor to effectively characterize combined sewer discharge effects and the efficacy of combined sewer discharge controls

The City is currently implementing these controls as required by the Combined Sewer Overflow Control Policy and has also developed a long-term control plan to optimize operations of the City's combined sewer collection and treatment system and maximize pollutant removal during wet weather.

Consistent with the Combined Sewer Overflow Control Policy and the long-term control plan, the City captures and treats 100 percent of the combined wastewater and stormwater flow collected in the combined sewer system during precipitation events. Captured flows on the eastside of the City are directed first to the Southeast Plant and North Point Wet Weather Facility for primary or secondary treatment and disinfection. Flows in excess of the capacity of these facilities are diverted to storage and transport boxes constructed around much of the City, and receive the equivalent to primary treatment prior to discharge to San Francisco Bay. The long-term control plan specifies operational parameters that must be met in each drainage basin before a combined sewer discharge

[44] United States Environmental Protection Agency, Federal Register, Part VII, Combined Sewer Overflow (CSO) Control Policy; Notice, April 19, 1994.

can occur, and includes the following long-term average annual design goals for combined sewer discharges.

- Four combined sewer discharge events along the North Shore;
- Ten combined sewer discharge events from the Central Basin (which includes the project site); and
- One combined sewer discharge event along the Southeast Sector.

The Combined Sewer Overflow Control Policy allows for this annual average to be exceeded in any particular year as long as the long-term average is maintained at the appropriate level. The City is currently meeting these long-term average design goals for the overall Bayside drainage basin.

Executive Order 11988

Under Executive Order 11988, the Federal Emergency Management Agency is responsible for management of floodplain areas defined as the lowland and relatively flat areas adjoining inland and coastal waters subject to a 1 percent or greater chance of flooding in any given year (the 10-year floodplain). The Federal Emergency Management Agency is a federal agency whose overall mission is to support citizens and first responders to ensure that the United States builds, sustains, and improves capabilities to prepare for, protect against, respond to, recover from, and mitigate all hazards. With regard to flooding, the Federal Emergency Management Agency provides information, guidance, and regulation associated with flood prevention, mitigation, and response. Under Executive Order 11988, the Federal Emergency Management Agency requires that local governments covered by the federal flood insurance program pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. Through its Flood Insurance and Mitigation Administration, the Federal Emergency Management Agency manages the National Flood Insurance Program, which includes flood insurance, floodplain management, and flood hazard mapping functions. The Federal Emergency Management Agency maps 100-year floodplains within its jurisdiction and provides flood insurance rate information via flood insurance rate maps.

State Regulations

California Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides for protection of the quality of 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 within the state. The statewide program for water quality control is therefore administered most effectively on a local level with statewide oversight. Within this framework, the act authorizes the State Water Resources Control Board and regional boards to oversee the coordination and control of water quality within California.

San Francisco Bay Water Quality Control Plan (Basin Plan)

San Francisco Bay waters are under the jurisdiction of the regional board, which established regulatory standards and objectives for water quality in San Francisco Bay in its Water Quality Control Plan for the San Francisco Bay Basin, commonly referred to as the Basin Plan.[45] The Basin Plan identifies existing and potential beneficial uses for surface waters and provides numerical and narrative water quality objectives designed to protect those uses. The preparation and adoption of water quality control plans are required by the California Water Code (section 13240) and supported by the federal Clean Water Act. Changes in surface water standards must be approved by the U.S. EPA.

The project site is located adjacent to Lower San Francisco Bay. The combined sewer discharge structures for the Islais Creek watershed discharge to Islais Creek and the Central Basin of Lower San Francisco Bay. The combined sewer discharge structures for the 20th Street sub-basin also discharge to the Central Basin of Lower San Francisco Bay. Identified beneficial uses for Lower San Francisco Bay are industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. Identified beneficial uses for the Central Basin of Lower San Francisco Bay and the tidal portions of Islais Creek are commercial and sport fishing, estuarine habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation.

Impaired Water Bodies and Total Maximum Daily Loads

As described above, under "Clean Water Act Section 303(d) and Total Maximum Daily Loads," p. 4.J-18, individual states must present the U.S. EPA with a list of impaired water bodies, defined as those water bodies that do not meet water quality standards. As required by the Clean Water Act, the U.S. EPA requires the development of Total Maximum Daily Loads to improve water quality of impaired water bodies. The first step of the Total Maximum Daily Load process is development of a report describing the water quality problem, detailing the pollutant sources, and outlining the solutions. The report includes an implementation plan that describes how and when pollution prevention, control, or restoration activities will be accomplished and who will be responsible for these actions. The final step is adopting and amending the Basin Plan to legally establish the Total Maximum Daily Load and to specify regulatory requirements for compliance. As part of a Basin Plan amendment, waste load allocations are specified for entities that have permitted discharges.

The U.S. EPA has approved Total Maximum Daily Loads for PCBs and mercury in San Francisco Bay, and they have been officially incorporated into the Basin Plan. The regional board adopted

[45] San Francisco Bay RWQCB, *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan),* May 4, 2017, *https://www.waterboards.ca.gov/sanfranciscobay/water_issues/programs/planningtmdls/basinplan/web/docs/BP_all_chapters.pdf,* accessed February 25, 2018.

the San Francisco Bay Watershed Permit (Order No. R2-2012-0096), which addresses mercury and PCBs in municipal and industrial wastewater discharges.[46]

National Pollutant Discharge Elimination System Waste Discharge Regulations

As discussed above under "Federal Regulations," section 402 of the federal Clean Water Act established the NPDES program to protect the water quality of receiving waters. The NPDES program requires all facilities that discharge pollutants into waters of the United States to obtain a permit. The permit provides two levels of control – technology-based limits and water-quality-based limits – to control discharge of pollutants to protect water quality. Technology-based limits are based on the ability of dischargers in the same category to treat wastewater, while water-quality-based limits are required if technology-based limits are not sufficient to protect the water body. Water-quality-based effluent limitations required to meet water quality criteria in the receiving water are based on criteria specified in the National Toxics Rule, the California Toxics Rule, and the Basin Plan. NPDES permits must also incorporate Total Maximum Daily Load wasteload allocations when they are developed. In California, the State Water Resources Control Board and the regional boards implement and enforce the NPDES program.

Construction General Stormwater Permit (State Water Board Order No. 2009-09-DWQ)

Stormwater discharges associated with construction activities that disturb more than 1 acre of land and could discharge to San Francisco Bay directly or via a separate stormwater system are subject to the state water board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (this is also referred to as the Construction General Stormwater Permit). Construction activities subject to this permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. Under the Construction General Stormwater Permit, construction projects are characterized by the level of risk to water quality, which is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Level 1, Level 2, or Level 3, and the minimum best management practices and monitoring that must be implemented during construction are based on the risk level. The best management practices are designed to prevent pollutants from contacting stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. They are specified in a Stormwater Pollution Prevention Plan (SWPPP) that must be prepared by a Qualified SWPPP Developer and submitted to the regional board before construction begins.

Sediment risk is determined based on the expected intensity of rainfall during the construction period, soil erodibility, and slope of the construction site. Therefore, the sediment risk for the proposed project would depend on when it is implemented, and the proposed project would have a higher sediment risk if construction were to occur during the rainy season rather than the dry season. Receiving water risk is based on whether the project drains to a sediment-sensitive water body. A sediment-sensitive water body is one that appears on the most recent 303(d) list for water

[46] San Francisco Bay RWQCB, *Waste Discharge Requirements for Mercury and PCBs from Municipal and Industrial Wastewater Discharges to San Francisco Bay, Order No. R2-2012-0096, NPDES No. CA0038849*, adopted December 12, 2012, *http://www.waterboards.ca.gov/sanfranciscobay/board_decisions/adopted_orders/2012/R2-2012-0096.pdf*, accessed February 25, 2018.

bodies as impaired for sediment; has a U.S. EPA-approved Total Maximum Daily Load implementation plan for sediment; or has the beneficial uses of cold freshwater habitat, fish migration, and fish spawning. Lower San Francisco Bay (the receiving water for construction activities) is not considered a sediment-sensitive water body under the Construction General Stormwater Permit because it is not listed as impaired for sediment and does not have all three beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Groundwater General Permit (Regional Board Order No. R2-2012-0060)

The Regional Water Quality Control Board has issued Order Number R2-2012-0060 (referred to as the Groundwater General Permit), which is a general permit for the discharge or reuse of extracted brackish groundwater, concentrated brine resulting from the treatment of brackish groundwater,[47] and extracted groundwater from structural dewatering that requires treatment. The permit specifies effluent limitations for the discharges, receiving water limitations, and discharge prohibitions (including flow rate and restrictions on scouring and erosion). Monitoring requirements for demonstrating permit compliance are also specified. To obtain authorization to discharge under this permit, the discharger must submit a Notice of Intent describing the proposed discharge and treatment system and the regional board must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit. Under this order, extracted groundwater may be reused for purposes such as dust control or soil compaction on construction sites, provided that reuse complies with the water reclamation specifications of the order.

This order does not cover the discharge of groundwater that requires treatment due to contamination from fuels or volatile organic compounds. Such discharges must seek coverage under the Volatile Organic Compound and Fuel General Permit, which is described below.

Volatile Organic Compound and Fuel General Permit (Regional Board Order No. R2-2012-0012)

The Regional Water Quality Control Board has issued Order Number R2-2012-0012 which is a general permit for the discharge of extracted and treated groundwater resulting from the cleanup of groundwater polluted by volatile organic compounds and fuels (referred to as the Volatile Organic Compound and Fuel General Permit). The permit specifies effluent limitations for the discharges, receiving water limitations, and discharge prohibitions (including flow rate and restrictions on scouring and erosion). Monitoring requirements for demonstrating permit compliance are also specified. To obtain authorization to discharge under this permit, the discharger must submit a Notice of Intent describing the proposed discharge and treatment system and the regional board must issue an Authorization to Discharge once it is determined that the discharger is eligible to discharge under the permit.

Small MS4 General Stormwater Permit (State Water Board Order No. 2013-001-DWQ)

On February 5, 2013, the state water board adopted the Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems (MS4s), Order No. 2013-001-DWQ (Small MS4 General Stormwater Permit). Areas that drain to separate stormwater

[47] Brackish groundwater is groundwater with a high salinity or total dissolved solids content.

collection systems in San Francisco are subject to this permit. The Small MS4 General Permit identifies specific best management practices and management measures to be addressed and requires permittees to submit a guidance document to the state water board documenting their strategies for complying with permit requirements. The required program includes specific elements related to program management, education and outreach on stormwater impacts, public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff and control, pollution prevention/good housekeeping for permittee operations, post-construction stormwater management for new development and re-development, water quality monitoring requirements, program effectiveness assessment, and annual reporting. For renewal permittees such as the City, the guidance document must identify and describe best management practices included in their previous Stormwater Management Plan that may be more protective of water quality than the minimum requirements of the updated permit, and identify whether the permittee proposes to maintain, reduce, or cease implementation of the best management practices.

Southeast Plant, North Point, and Bayside Facilities NPDES Permit (Regional Board Order No. 2013-0029)

The City currently holds an NPDES permit (Regional Water Quality Control Board Order No. R2-2013-0029) adopted by the regional board in August 2013 that covers the Southeast Plant, the North Point Wet Weather Facility, and all of the Bayside wet-weather facilities, including combined sewer discharges to San Francisco Bay.[48] The permit specifies discharge prohibitions, dry-weather effluent limitations, wet-weather effluent performance criteria, receiving water limitations, sludge management practices, and monitoring and reporting requirements. It prohibits overflows from the combined sewer discharge structures during dry weather, and requires wet-weather overflows to comply with the nine minimum controls specified in the federal Combined Sewer Overflow Control Policy, described above, and the City's Long Term Control Plan. Areas in the Bayside drainage basin, including the project site, that drain to the City's combined sewer system are subject to this permit.

As discussed above under "Federal Combined Sewer Overflow Control Policy," the NPDES permit does not explicitly regulate the number, volume, duration, or frequency of combined sewer discharges from the combined sewer system, but instead requires that the system meets the long-term average annual design goals for combined sewer discharges from each sub-basin. Under the Long-Term Control Plan, the City must optimize operations of the combined sewer system to minimize combined sewer discharge frequency, magnitude, and duration and maximize pollutant removal during wet weather, and must also provide treatment of all discharges from the combined sewer system, including combined sewer discharges. The NPDES permit also requires the City to monitor the water quality of all combined sewer discharges and the efficacy of wet-weather discharge controls. If the combined sewer discharges cause a violation of water quality standards in the receiving water, the City must evaluate its Long-Term Control Plan and combined sewer system operation to ensure compliance with applicable water quality standards.

[48] San Francisco Bay Regional Water Quality Control Board, NPDES Permit No. CA0037664, Order No.R2-2013-0029, for City and County of San Francisco Southeast Water Pollution Control Plant, North Point Wet Weather Facility, Bayside Wet Weather Facilities and Wastewater Collection System, adopted August 19, 2013.

Inland Surface Waters, Enclosed Bays, and Estuaries Plan

On April 7, 2015, the state water board adopted an amendment to the Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Referred to as the Trash Amendment, this amendment prohibits the presence of trash in inland surface waters, enclosed bays, estuaries, and along shorelines in amounts that "adversely affect beneficial uses or cause nuisance." Compliance with this prohibition is achieved through compliance with NPDES permit limitations, waste discharge requirements, and waivers that prohibit the discharge of trash. Discharges that are not subject to these regulatory requirements are also required to comply.

MS4 permittees with authority over priority land uses[49] such as the mix of commercial and high density residential uses that would be developed under the proposed project, are required to comply with the discharge prohibitions. Compliance may be achieved using a full capture system[50] (Track 1) or a combination of full capture systems and systems that provide equivalent control (Track 2). The Trash Amendment also requires that trash is eliminated from all stormwater and non-stormwater discharges from construction activities regulated under the Construction General Stormwater Permit. If this is not economically feasible, dischargers must meet the requirements of Track 1 or Track 2, which are described above.

The Trash Amendment required modification or reissuance of existing NPDES permits to include the requirements of the Trash Amendment within 18 months of adoption of the amendment (October 7, 2016). Existing and new permittees must submit an implementation plan within three months of adoption of the implementing permit. MS4 permittees must achieve full compliance with the requirements of the Trash Amendment within 10 years of the effective date of the first implementing permit, and must achieve interim milestones during the first 10 years to show progress towards achieving full implementation.

McAteer-Petris Act

The McAteer-Petris Act of 1965 established the Bay Conservation and Development Commission (BCDC) as a temporary state agency in charge of preparing the San Francisco Bay Plan, described below. In 1969, the act was amended to make BCDC a permanent state agency and to incorporate the policies of the San Francisco Bay Plan into state law.

San Francisco Bay Conservation and Development Commission Permits

BCDC has permitting authority for most projects occurring within San Francisco Bay and along the shoreline, which is defined in the McAteer-Petris Act to include bay waters up to the mean high water line at 6.0 feet NAVD88[51] and the area 100 feet landward of and parallel to the mean high water line, known as the "shoreland band." Under the McAteer-Petris Act, an agency or individual must secure a permit from BCDC if they propose to place fill, dredge sediment, or place dredged

49 Under the Trash Amendment, priority land uses are considered high density residential uses, commercial land uses, industrial land uses, mixed urban uses, and public transportation stations.

50 A full capture system is one that can treat the entire peak flow of stormwater resulting from a one-year storm, one hour storm or is designed and sized to carry at least the same flow as the corresponding storm drain.

51 WRA, *Permitting Approach for the Potrero Power Plant Redevelopment Project*, December 15, 2017.

materials into the San Francisco Bay or certain tributaries within BCDC jurisdiction. Most activities within the 100-foot shoreline band are also subject to a permit from BCDC. The type of permit issued depends on the nature and scope of the proposed activities. Construction of elements of the proposed project within BCDC's jurisdiction would require a Major Permit under the McAteer-Petris Act.

San Francisco Bay Plan and San Francisco Waterfront Special Area Plan

BCDC completed and adopted the San Francisco Bay Plan in 1968, and the plan has been periodically amended since its adoption, most recently in 2011 to address climate change and shoreline protection. In 1975, after a collaborative planning process with the San Francisco Planning Department, the BCDC adopted the San Francisco Waterfront Special Area Plan. The Waterfront Special Area Plan was substantially amended in 2000. Together, this plan, the McAteer-Petris Act, the San Francisco Bay Plan, and subsequent amendments to all three documents prescribe a set of rules for shoreline development along the San Francisco waterfront. Several policies of the San Francisco Bay Plan are aimed at protecting San Francisco Bay's water quality, ensuring the safety of fills, and guiding the dredging of the bay's sediment.

Regional Regulations

There are no regional regulations that apply to water quality in the project area.

Local Regulations

San Francisco Public Works Code, Article 4.2 – Stormwater Management Requirements and Design Guidelines

Development projects that discharge stormwater to either the combined sewer system or a separate stormwater system must comply with article 4.2 of the San Francisco Public Works Code (public works code), section 147, which was last updated on April 27, 2016. The SFPUC and the Port have developed San Francisco Stormwater Management Requirements and Design Guidelines in accordance with the requirements of the Small MS4 General Stormwater Permit and article 4.2, section 147.[52]

The Stormwater Management Requirements and Design Guidelines describe the regulatory context for a post-construction stormwater control program and provide tools to help project developers achieve compliance with stormwater management requirements, including but not limited to:

- A set of stormwater best management practice fact sheets;
- A vegetation palette to assist in bioretention best management practice - appropriate plant selection;
- Sizing calculators to determine the required size of each best management practice; and

[52] SFPUC and Port of San Francisco, *San Francisco Stormwater Management Requirements and Design Guidelines*, April 2016.

- Illustrative examples of green infrastructure.

In accordance with the Stormwater Management Requirements and Design Guidelines, developers of projects that create and/or replace 5,000 square feet or more of impervious surface and discharge to the combined sewer system must implement best management practices to manage the flow rate and volume of stormwater going into the combined sewer system by achieving Leadership in Energy and Environmental Design (LEED®) Sustainable Sites Credit 6.1 (Stormwater Design: Quantity Control). This credit includes two different standards for post-construction stormwater controls depending on the amount of existing impervious surfaces. For covered projects with 50 percent existing impervious surfaces or less, the stormwater management approach must prevent the stormwater runoff flow rate and volume from exceeding existing conditions for storms that produce a rainfall depth of 2.9 inches in 24-hours and a rainfall intensity of approximately 2.4 inches per hour (referred to as the one- and two-year 24-hour design storm). For covered projects that include more than 50 percent existing impervious surfaces, the stormwater management approach must reduce the existing stormwater runoff flow rate and volume by 25 percent for a two-year 24-hour design storm.

The Stormwater Management Requirements and Design Guidelines require low-impact development measures to reduce the rate of stormwater runoff and to reduce and delay the volumes of discharge entering the combined sewer system, thereby reducing the frequency of combined sewer overflows, minimizing flooding effects, and protecting water quality. Examples of best management practices that may be implemented include rainwater harvesting, rain gardens, green roofs, and permeable paving.

Developers of projects that discharge to a separate stormwater system must also implement best management practices to reduce the flow rate and volume and improve the quality of stormwater going into the separate stormwater system. In areas served by separate stormwater systems, the Stormwater Management Requirements and Design Guidelines specify different performance requirements according to the following project size thresholds:

- Small project: 2,500 to 5,000 square feet of impervious surface created and/or replaced.
- Large project: 5,000 square feet or more of impervious surface created and/or replaced.

Small projects that discharge to a separate stormwater system must implement one or more site design measure(s) (e.g., tree planting and preservation, permeable pavement, green roofs, vegetated swales, rainwater harvesting, etc.). Large projects must implement source controls and best management practices to meet performance requirements and must manage runoff from storms that produce a rainfall depth of 0.75 inch in 24 hours and a rainfall intensity of approximately 0.24 inch per hour (referred to as the 90th percentile, 24-hour storm).

The Stormwater Management Requirements and Design Guidelines also require developers to use certain preferred best management practices to the maximum extent feasible before considering use of remaining best management practices. The preferred best management practice hierarchy prioritizes infiltration-based best management practices, rainwater harvesting, and vegetated roofs followed by lined bioretention (e.g., lined bioretention materials with an underdrain, commonly

known as a flow-through planter). If none of these best management practices are feasible on site, projects may be able to incorporate high-rate filtration best management practices (e.g., tree-box filters and media filters) into their site design pending approval by the SFPUC. The SFPUC may inspect stormwater best management practices once they are constructed, and the project applicant must correct any issues noted by the inspector.

Modified Compliance Program

The City has developed the Modified Compliance Program to allow development projects with proven site challenges and limitations to modify the standard stormwater performance requirements set by the Stormwater Management Requirements and Design Guidelines. The Modified Compliance Program applies only to projects in areas of the city that are served by the combined sewer system.

To qualify for modified compliance, a site owner must submit a modified compliance application to the SFPUC that documents existing and proposed site features that limit infiltration such as high groundwater, shallow depth to bedrock (which occurs at some locations in the project site), poorly infiltrating soils, steep slopes, contamination, or limited space for infiltration. The application also requires the applicant to estimate the non-potable water demand for the project if the project is subject to the City's Recycled Water Ordinance. Based on this information, the SFPUC can modify the requirements related to the volume and peak flow of stormwater runoff based on approved site-specific constraints.

San Francisco Public Works Code, Article 4.2 – Construction-Related Stormwater Discharges

In addition to the state stormwater regulations described above, discharges of construction-related stormwater runoff are subject to the construction site runoff requirements of article 4.2 of the public works code, section 146. In accordance with these requirements, developers must obtain a Construction Site Runoff Control Permit from the SFPUC for any construction activity that disturbs 5,000 square feet or more of ground surface, such as the proposed project. For all land-disturbing activities, regardless of size, they must also implement and maintain best management practices to minimize surface runoff, erosion, and sedimentation. Regulated land-disturbing activities include building demolition, clearing, grading, grubbing, filling, stockpiling, excavating, and transporting soil. The permit specifically requires easements for drainage facilities; provision of adequate dust controls in conformance with applicable air quality laws and regulations; and improvement of any existing grading, ground surface, or site drainage to meet the requirements of article 4.2. The application for the permit must also include an Erosion and Sediment Control Plan. A building permit cannot be issued until the SFPUC issues a Construction Site Runoff Control Permit.

Under the Construction Site Runoff Control Permit, the project sponsor would be required to conduct daily inspections and maintenance of all erosion and sediment controls and must provide inspection and maintenance information to the SFPUC. The SFPUC would also conduct periodic inspections of the construction site to ensure compliance with the plan. The project sponsor would be required to notify the SFPUC at least two days prior to the start of construction, completed installation of erosion and sediment control measures, completion of final grading, and completion

of project construction. At the SFPUC's discretion, sampling, metering, and monitoring also may be required.

San Francisco Public Works Code, Article 4.1—Wastewater Discharges to Combined Sewer System

Discharges of non-sewage wastewater to the combined sewer system (such as groundwater dewatering effluent and wastewater from commercial and industrial land uses, but not including stormwater) are subject to the permit requirements specified in article 4.1 of the public works code and supplemented by Public Works order No. 158170. The permit requires the project sponsor to develop and implement a pollution prevention program, and it specifies discharge limitations for specific chemical constituents as well as general conditions for the discharge. In addition, the discharge must meet the pretreatment standards specified in article 4.1. The party responsible for the discharge must monitor the discharge quality for compliance with permit limitations and must also submit periodic reports to the SFPUC. The City conducts periodic inspections to ensure compliance.

San Francisco Recycled Water Use Ordinance

The City's Recycled Water Ordinance, which added article 22 of the public works code, requires property owners located within the designated recycled water use areas to install recycled water systems in certain development projects. The recycled water use area comprises the majority of the city's bayside waterfront area—including the project site—and some inland areas, as well as Treasure Island. The goal of the ordinance is to maximize the use of recycled water. Buildings and facilities that are located within the designated recycled water use areas are required to use recycled water for all uses authorized by the state, once a source of recycled water becomes available. Commonly approved uses of recycled water include irrigation, cooling, and/or toilet and urinal flushing. These systems must meet San Francisco Plumbing and Health codes, which include specifications for pipe type, pipe separation, backflow prevention assemblies, water meters, and signage.

The following types of developments that are located within the designated recycled water use area must comply with this ordinance (all apply to the proposed project):

- New construction or major alterations to a building totaling 40,000 square feet or more;
- All subdivisions; and
- New and existing irrigated areas of 10,000 square feet or more.

In a mixed-use residential building where a recycled water system is installed, any restaurant or other retail food-handling establishment must be supplied by a separate potable water system to ensure public health and safety.

The SFPUC is currently planning the Eastside Recycled Water project that will ultimately provide an estimated 2 mgd of recycled water on the bayside of San Francisco. However, this is not expected to be completed until 2029.[53] The proposed project is subject to the Recycled Water Use

[53] SFPUC, *Eastside Recycled Water Project*, *http://sfwater.org/index.aspx?page=1159*, accessed February 25, 2018.

Ordinance because it would be a subdivision, would include new construction of more than 40,000 square feet of building space, and would include more than 10,000 square feet of irrigated areas. However, there is currently no available source of recycled water at the project site because the Eastside Recycled Water project has not been constructed.

San Francisco Non-potable Water Program

In September 2012, the City adopted the Onsite Water Reuse for Commercial, Multi-family, and Mixed Use Development Ordinance. Commonly known as the Non-Potable Water Ordinance, it added Article 12C to the San Francisco Health Code, allowing for the collection, treatment, and use of alternate water sources for non-potable applications. The requirements of the Non-Potable Water Ordinance are:

- New development projects of 250,000 square feet or more of gross floor area that have not received a site permit prior to November 1, 2016 are required to install and operate an onsite non-potable water system to treat and reuse available graywater, rainwater, and foundation drainage for toilet and urinal flushing and irrigation, and
- New development projects of 40,000 square feet or more of gross floor area are required to prepare water budget calculations assessing the amount of available rainwater, graywater, and foundation drainage, and the demands for toilet and urinal flushing and irrigation.

Development projects implementing district-scale non-potable water systems may seek an alternative compliance approach to the Non-Potable Water Ordinance.

In accordance with the Permit to Operate, the onsite water system must treat the alternative water supply to water quality criteria specified by the health department, and these criteria are dependent on the alternate water source and the end use for the water.[54] The project would include the construction of more than 250,000 square feet of gross floor area. Therefore, the requirements of the Non-potable Water Program apply to the proposed project.

Well Permitting Requirements

There is a potential that the proposed project could require installation of groundwater dewatering wells during project construction. In accordance with article 12B of the health code, the health department must permit any groundwater well or soil boring. The well must also be constructed in accordance with the water well standards of the State of California and article 12B of the health code. The well may not be constructed until a well construction permit is issued by the health department.

Trash Management

Article 6 of the health code, Garbage and Refuse, requires that properties have appropriate containers placed in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight-fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The property owner must

[54] San Francisco Department of Public Health, *Director's Rules and Regulations Regarding Operation of Alternate Water Source Systems*, August, 2017.

also have adequate refuse collection service. Article 6 also prohibits the dumping of refuse onto any streets or lands within San Francisco.

4.J.4 Impacts and Mitigation Measures

Significance Criteria

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable criteria were used to determine whether implementing the proposed project would result in a significant impact related to hydrology or water quality. Implementation of the proposed project would have a significant effect related to hydrology or water quality if the project 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 that would result in substantial erosion or siltation on or offsite;
- 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 that would result in flooding on or offsite;
- 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 authoritative flood hazard delineation map;
- Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.

Approach to Analysis

Criteria Not Analyzed

The following criteria do not apply to the proposed project and are not analyzed in this section for the reasons described below:

- ***Substantially deplete groundwater supplies or interfere with groundwater recharge.*** The project site is located in the Downtown San Francisco Groundwater Basin, which is not used as a drinking water supply, and there are no plans for development of this basin for groundwater production. The proposed project would not deplete groundwater resources because other than temporary and limited dewatering during construction, the project would not involve the extraction of groundwater for any reason. The proposed project would not interfere with groundwater recharge because the project would result in a 15 percent reduction in impervious surfaces and would implement stormwater controls that would facilitate infiltration of treated stormwater to the groundwater. This would increase— and not deplete or interfere with — the amount of groundwater recharge at the project site. Therefore, the project would have no impact on groundwater resources, and this criterion is not discussed further.

- ***Expose people or structures to a significant risk of loss, injury, or death involving failure of a levee or dam.*** There would be no impact related to this topic because there are no levees or dams in the vicinity of the project site, and the project site is not located within the inundation area of any San Francisco reservoirs.[55]

Project Features

Various project features during both construction and operation have the potential to affect water quality and hydrology. Certain operational features proposed along the shoreline are subject to flooding and sea level rise considerations.

During construction, stormwater runoff and associated discharges have the potential to exceed water quality criteria or waste discharge requirements, including NPDES and City permit effluent limitations. Any discharges of groundwater produced during excavation dewatering could also exceed these criteria. The project's construction activities that could result in hydrology or water quality related impacts include grading and excavation for the construction of basements for new buildings; construction of street improvements; construction of the new pump station; and installation of new utilities for potable water, recycled water, fire protection water, wastewater, stormwater, electricity, and natural gas. In-water construction activities could also affect bay water quality. These activities include abandonment of the inlet and outlet structures associated with the Unit 3 Power Block, construction of the recreational dock, construction of a new stormwater outfall if a separate stormwater system is constructed, and removal of fill as mitigation for new bay fill created by the project.

During operation, the specific project elements that could result in hydrology and water quality impacts include increases in wastewater generated by the project that could result in changes in combined sewer discharge frequencies and affect bay water quality. In addition, long term changes in stormwater drainage patterns could affect combined sewer discharge frequencies, exceed the capacity of the stormwater system, provide additional sources of polluted runoff, and/or exceed water quality criteria. Littering by future site occupants and visitors could also degrade water quality. As described in Chapter 2, Project Description, the proposed buildings would be constructed to

[55] San Francisco Planning Department, *Community Safety, an Element of the General Plan of the City and County of San Francisco,* October 2012, Map 06.

withstand hydrostatic pressure from the surrounding groundwater and would be waterproofed to prevent intrusion of groundwater. Therefore, permanent dewatering would not be required.

Alteration of the shoreline and construction of new project features such as docks or new buildings within a flood zone could also affect flooding (including flooding as a result of 100-year flooding under existing conditions, future flooding as a result of sea level rise, and flooding as a result of a tsunami).

Methodology for Impact Analysis

The impact assessment includes an evaluation of water quality issues related to on-land construction activities as well as in-water activities for construction of the recreational dock, removal of fill as mitigation for new bay fill created by the project, abandonment of the inlet and outlet structures associated with the Unit 3 Power Block, and construction of a new stormwater outfall if a separate stormwater system is constructed. Operational impacts related to changes in flows to the city's combined sewer system and the proposed separate stormwater system that could be constructed under the proposed project also are discussed along with water quality impacts related to changes in bay water circulation as a result of the new recreational dock, maintenance dredging, and littering. This is followed by a discussion of potential impacts related to an alteration of drainage patterns, flooding, and tsunami inundation.

Construction Impacts

Construction impacts of the proposed project are discussed in Impact HY-1. Construction activities that could result in a violation of water quality standards or degradation of water quality include on-land construction and demolition activities, construction dewatering, and in-water construction activities. The analysis considers whether, compliance with regulatory requirements designed to protect water quality would ensure that these water quality-related impacts are less than significant during construction. Applicable regulatory requirements include: section 401 Water Quality Certification, section 404 of the Clean Water Act, section 10 of the Rivers and Harbors Act, BCDC requirements, the state water board Construction General Stormwater Permit, the Groundwater General Permit, the Volatile Organic Compound and Fuel General Permit, and article 4.2 of the San Francisco Public Works Code, section 146.

In-water construction activities could also disrupt the cap to be installed as part of PG&E's remediation of the nearshore sediments in the Offshore Sediment Area. The analysis considers whether disturbance of the cap would occur and would result in significant water quality impacts.

Operational Impacts

The impact analysis of the long-term operation of the proposed project is presented in Impacts HY-2 through HY-6.

Impact HY-2 discusses whether the project would result in a violation of water quality standards or otherwise affect water quality. This impact is broken down into the following aspects of project operations that could affect water quality:

- **Stormwater discharges:** The analysis considers whether stormwater discharges from the proposed project would result in a violation of water quality standards or otherwise degrade water quality. It also considers whether the project would provide an additional source of polluted runoff. If not, impacts related to these topics are considered less than significant.

  The analysis also considers whether stormwater discharges from the new storm drain system constructed as part of the dual sewer option would disrupt the sediment cap installed by PG&E in the Nearshore Zone of the Offshore Sediment Area in a manner that would degrade water quality. If not, the impact is considered less than significant.

- **Wastewater discharges:** The analysis considers whether wastewater discharges from the proposed developments would result in a violation of water quality standards or otherwise degrade water quality. If not, the impact is considered less than significant.

- **Exceeding the capacity of the stormwater system:** The analysis considers whether stormwater discharges from the project site would exceed the capacity of the stormwater systems constructed under the proposed project. If not, the impact is considered less than significant.

- **Changes in Combined Sewer Discharges:** The analysis considers whether the discharge of wastewater and stormwater to the City's combined sewer system during project operation could contribute to an increase in the frequency of combined sewer discharges during wet weather. The impact is considered less than significant if the increased flows would not cause an increase the frequency of combined sewer discharges above the long-term average specified in the Bayside NPDES permit.

- **Changes in circulation:** The analysis considers whether installation of new piles for the recreational dock would change long-term circulation patterns in the bay in a way that erosional patterns were changed, or water quality were substantially affected. If not, the impact is considered less than significant.

- **Maintenance dredging:** The analysis considers whether maintenance dredging for the recreational dock would result in water quality degradation as a result of dredging activities, or disruption of PG&E's off shore sediment remediation. If not, the impact is considered less than significant.

- **Littering:** The analysis considers whether compliance with regulatory requirements for trash management would prevent substantial water quality degradation from litter that could be transported to the bay via stormwater runoff or wind. If so, the impact is considered less than significant.

Impact HY-3 assesses whether the project would alter drainage patterns in a way that results in onsite or offsite siltation, erosion, or flooding. If not, the impact is considered less than significant.

Impacts related to existing and future flooding (including existing flooding risks, flooding due to climate change-induced sea level rise, and flooding due to tsunami inundation) are discussed in Impacts HY-4 through HY-6. CEQA does not require lead agencies to consider how existing hazards or conditions might impact a project's users or residents, except where the project would significantly exacerbate an existing environmental hazard. Accordingly, hazards resulting from a project that places development in a tsunami inundation zone or an existing or future flood hazard area are not considered impacts under CEQA unless the project would significantly exacerbate the tsunami inundation or flood hazard. Thus, the impact analysis evaluates whether the proposed project would substantially exacerbate an existing or future flood hazard in the project area,

resulting in a substantial risk of loss, injury, or death. The impact is considered significant if the proposed project would substantially exacerbate flood hazards by increasing the frequency or severity of flooding or causing flooding to occur in an area that would not be subject to flooding without the project.

Methodology for Analysis of Cumulative Impacts

Impacts related to hydrology and water quality could affect Lower San Francisco Bay as well as the eastern drainage basin of San Francisco's combined sewer system. Accordingly, the geographic scope of hydrology and water quality impacts includes Lower San Francisco Bay and the geographical area that drains to the eastern drainage basin. The cumulative analysis uses a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in the immediate vicinity (see Table 4A-2, Cumulative Projects in the Project Vicinity, in Section 4.A of this chapter).

The analysis of cumulative impacts related to wet weather flows to the combined sewer system, considers whether the proposed project in combination with past, present, and reasonably foreseeable future projects would increase the frequency of combined sewer discharges above the long-term average specified in the Bayside NPDES permit. If so, the analysis considers whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

The analysis of other cumulative impacts related to a violation of water quality standards and degradation of water quality assumes that construction and operations of other projects in the geographical area would have to comply with the same regulatory requirements as the project. The analysis then considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and probable future projects, and if so, whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

The analysis of cumulative impacts related to existing and future flooding considers whether the proposed project in combination with potentially cumulative projects would substantially exacerbate flooding conditions. If so, the analysis considers whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

Impact Evaluation

Construction Impacts

Impact HY-1: Construction of the proposed project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade water quality. *(Less than Significant)*

Construction of the proposed project would include both on-land construction activities that are conducted above the high tide line (which occurs at an elevation of 7.5 feet NAVD88) and in-water construction activities that would occur below the high tide line. Water quality impacts related to on-land and in-water construction activities are described separately, below. This is followed by a discussion of impacts related to construction dewatering. All of these impact analyses discuss the regulatory requirements in place to ensure that construction activities would not violate water quality standards or waste discharge requirements, or substantially degrade water quality.

Water Quality Effects of On-Land Construction Activities

Grading and earthmoving for the on-land construction of utilities and infrastructure, demolition of existing buildings, and construction of individual development projects within the project site would expose soil during construction. Without proper controls, these activities could result in erosion and excess sediments carried in stormwater runoff, which in turn could affect water quality if transported to the bay. Stormwater runoff from temporary on-site use and storage of vehicles, fuels, wastes, and building materials could also carry pollutants if these materials were improperly handled.

However, the Clean Water Act effectively prohibits discharges of stormwater from construction projects unless the discharge is in compliance with an NPDES permit. As discussed below, stormwater from the project site would drain to the City's combined sewer system, a new separate stormwater system constructed under the proposed project, or directly to San Francisco Bay. Construction-related stormwater discharges to the combined sewer system would be subject to and treated in accordance with the Bayside NPDES Permit, and construction-related stormwater discharges to the separate stormwater system or directly to San Francisco Bay would be subject to and treated in accordance with the Construction General Stormwater Permit. Both of these NPDES permits are described under "State Regulations" p. 4.J-21, above and apply to on-land construction activities that would be conducted inland of the high tide line.

Construction-Related Stormwater Discharges to Combined Sewer System

Construction activities conducted within areas served by the City's existing combined sewer system or the new combined sewer system infrastructure that would be constructed under the proposed project would be subject to the Construction Site Runoff requirements of article 4.2 of the public works code, section 146. Applicable activities include construction of utilities, roadways, other infrastructure, and demolition of existing buildings, as well as excavation for soil remediation and for construction of the proposed buildings.

The Construction Site Runoff Control Permit is required for projects that involve any land-disturbing activities such as building demolition, clearing, grading, grubbing, filling, stockpiling, excavating, and transporting soil. The permit application must include an Erosion and Sediment Control Plan that provides a vicinity map showing the location of the site in relationship to the surrounding area's water courses, water bodies, and other significant geographic features; a site survey; suitable contours for the existing and proposed topography; area drainage; proposed construction and sequencing; proposed drainage channels; proposed erosion and sediment controls; dewatering controls where applicable; soil stabilization measures where applicable; maintenance controls; sampling, monitoring, and reporting schedules; and any other information deemed necessary by the SFPUC. The Erosion and Sediment Control Plan would also include the appropriate best management practices to prevent stormwater contact with hazardous materials stored at the construction site and to limit the potential for a release of these hazardous materials that could affect water quality.

Article 4.2 also specifies that the contractor must provide adequate dust controls in conformance with applicable air pollution laws and regulations (including article 22B of the health code, described in Section 4.K, Hazards and Hazardous Materials, and Section 4.G, Air Quality). Improvements to any existing grading, ground surface, or site drainage must also meet the requirements of article 4.2 for new grading, drainage, and erosion control. A building permit cannot be issued until a Construction Site Runoff Control Permit has been issued.

Under the Construction Site Runoff Control Permit, the project sponsor would be required to conduct daily inspections and maintenance of all erosion and sediment controls and must provide inspection and maintenance information to the SFPUC. The SFPUC would also conduct periodic inspections of the project site to ensure compliance with the plan. The project sponsor would be required to notify the SFPUC at least two days prior to the start of construction, at completion of installation of erosion and sediment control measures, at completion of final grading, and at project completion. At the SFPUC's discretion, sampling, metering, and monitoring may also be required.

Implementation of the Construction Site Runoff requirements of article 4.2 of the public works code, section 146 (which ensures compliance with the aforementioned Bayside NPDES permit), would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff in areas served by the existing or future combined sewer system would be *less than significant*.

Construction-Related Stormwater Discharges to Separate Stormwater System or to the Bay

Construction activities conducted within areas that drain to San Francisco Bay or to the existing or proposed separate stormwater system that could be constructed under the proposed project would be subject to the Construction General Stormwater Permit. Applicable activities include construction of the shoreline improvements above the high tide line and construction for the installation of new utilities, roadways, and other infrastructure, as well as demolition of existing buildings and excavation for construction of the proposed buildings.

Construction of the shoreline improvements has the greatest potential to cause water quality effects in San Francisco Bay because these activities would involve excavation, disruption of slopes, and

placement of rock immediately adjacent to San Francisco Bay. These improvements would be constructed along the shoreline slope between the high tide line at 7.5 feet NAVD88 and the finished top elevation of the shoreline improvements at 17.5 feet NAVD88. Sediment from these construction activities could potentially become entrained in stormwater runoff, or a release of hazardous materials used during construction could occur, potentially degrading water quality in San Francisco Bay. See Impact HZ-1 in Section 4.K, Hazards and Hazardous Materials for further discussion of the potential for a release of hazardous materials during construction.

Excavation for the installation of new utilities, roadways, and other infrastructure, as well as demolition of existing buildings and excavation for the proposed developments, could also result in runoff to the new separate stormwater system, if constructed. This new separate stormwater system would discharge to San Francisco Bay via a new outfall, and stormwater runoff from construction activities that discharge to this system could carry sediment or a release of hazardous materials used during construction to San Francisco Bay.

Under the Construction General Stormwater Permit, construction of the shoreline improvements and other on-land construction activities that would drain to the new separate stormwater system, if constructed, would be characterized by the level of risk to water quality. This is determined using a combination of the sediment risk of the project and the receiving water quality risk. Projects can be characterized as Risk Level 1, Level 2, or Level 3, and the minimum best management practices (stormwater controls) and monitoring that must be implemented during construction are based on the risk level. The best management practices are designed to prevent pollutants from coming into contact with stormwater and to keep all products of erosion and stormwater pollutants from moving offsite into receiving waters. They are specified in a Stormwater Pollution Prevention Plan (SWPPP) that must be prepared by a Qualified SWPPP Developer and submitted to the regional board before construction begins. Construction activities under the proposed project would not be characterized as Risk Level 3, because Lower San Francisco Bay is not considered a sediment-sensitive water body under the Construction General Stormwater Permit, as described under "Construction General Stormwater Permit (State Board Order No. 2009-09-DWQ."

For construction activities characterized as Risk Level 1, the Construction General Stormwater Permit specifies minimum best management practices to be implemented that address good housekeeping practices (including those for managing hazardous materials used during construction), non-stormwater management, erosion and sediment control, and run-on and runoff control. For construction activities characterized as Risk Level 2, the minimum requirements identified for Risk Level 1 apply, as well as some more stringent requirements. For instance, erosion controls must be implemented in conjunction with sediment controls in active construction areas, and linear sediment controls such as silt fences, gravel bag berms, or fiber rolls must be used along slopes. For Risk Level 1 or 2 construction activities, a qualified professional must inspect the required physical measures weekly when there is no rain and daily during a qualifying rainstorm. In addition, a Qualified SWPPP Developer must prepare a rain event action plan for Risk Level 2 construction activities. This plan would identify the designated site stormwater manager, the provider of erosion and sediment controls, and the stormwater sampling agent, as well as the types of construction workers active at the site during all construction phases. The plan would include suggested actions for each construction phase.

Compliance with the Construction General Stormwater Permit and implementation of specified control measures would ensure that water quality impacts related to violation of water quality standards or degradation of water quality due to discharge of construction-related stormwater runoff to San Francisco Bay, either directly or via the new separate stormwater system (if constructed), would be *less than significant*.

As discussed in Section 4,K, Hazards and Hazardous Materials, PG&E has installed a shoreline revetment on the shore of the bay adjacent to the Northeast area (see Figure 4.K-1, p. 4.J-3), as an interim remedial measure[56] to stabilize and limit erosion of the shoreline and embankment; limit direct contact with the manufactured gas plant constituents on the shoreline; and enhance the shoreline appearance. Shoreline improvements constructed under the proposed project would generally avoid this interim remediation measure. However, if construction of project-related improvements were to disturb this area, the construction activities would need to implement the requirements of PG&E's risk management plan to be prepared for the Offshore Sediment Area, as approved by the regional board (see Section 4.K, Hazards and Hazardous Materials for a description of the risk management plan to be prepared by PG&E for this area).

Water Quality Effects of In-Water Construction Activities

Chapter 2 As discussed in "Wetlands and Other Jurisdictional Waters" p. 4.I-11 in Section 4.I, Biological Resources, San Francisco Bay is a navigable water of the United States. Therefore, San Francisco Bay is considered a jurisdictional water of the U.S. regulated by the Corps under section 10 of the Rivers and Harbors Act up to the mean high water mark at an elevation of 6.0 feet NAVD88. San Francisco Bay is also considered jurisdictional waters of the U.S. and regulated by the Corps under Section 404 of the Clean Water Act up to the high tide line at an elevation of 7.5 feet NAVD88. These waters are also regulated by the regional board as Waters of the State, and BCDC regulates the fill and extraction of materials in San Francisco Bay below the high tide line (see Impact BI-4 in Section 4.I, Biological Resources, for further discussion of the requirements specified by these regulations). Therefore, any work along San Francisco Bay shoreline below the high tide line, which is at an elevation of 7.5 feet NAVD88, is considered in-water construction.

The proposed project includes several features that would involve in-water construction including: construction of the recreational dock, removal of fill as mitigation for new bay fill created by the project, abandonment of the inlet and outfall structures associated with the Unit 3 Power Block, and construction of a new stormwater outfall if a separate stormwater system is constructed. These construction activities would result in short-term disturbance of localized San Francisco Bay sediments and would temporarily re-suspend these sediments, potentially resulting in temporary adverse water quality effects including increased turbidity and suspended solids in the immediate vicinity of the construction activities. The sediments may also contain chemicals from historic activities, including those identified in the offshore sediments (see Section 4.K, Hazards and Hazardous Materials, for a description of PG&E's plans for remediation of the offshore sediments).

[56] An interim remedial measure is one that is implemented to address an immediate risk to human health or the environment while remedial planning is still in progress to develop a more comprehensive site remedy.

Turbidity is a condition in which the concentration of particles suspended in the water is increased, making the water appear cloudy. The suspended solids can lower the levels of dissolved oxygen levels in water, increase the salinity of the water, and decrease light penetration into the water. In addition, nutrient loading can occur as a result of resuspension of sediments. For all in-water construction activities, the overall water quality effect would be minor because of the very small area that would be disturbed and the temporary nature of the disturbance. Please refer to Section 4.I, Biological Resources, for a discussion of effects of in-water construction activities on marine species.

The project sponsor would also implement the in-water construction avoidance and minimization measures that are incorporated into the project as discussed in Chapter 2, Project Description, which would further reduce water quality effects related to in-water construction. Further, the in-water construction activities would be subject to the permits described above under "Federal Regulations." These include permits under section 10 of the Rivers and Harbors Act and/or section 404 of the Clean Water Act issued by the Corps that would receive water quality certification from the regional board in accordance with section 401 of the Clean Water Act. The project would be required to implement the conditions of these permits. Placement of fill below the high tide line would also be subject to a permit from BCDC, which would ensure that the water quality policies of the San Francisco Bay Plan are implemented. The permits may modify the avoidance and minimization measures specified in Chapter 2, Project Description, including adding best management practices for enhanced protection of water quality. The analysis below discusses the applicability of these legal requirements to each in-water construction activity.

Recreational Dock and Removal of Bay Fill

For construction of the recreational dock and removal of fill as mitigation for bay fill, implementation of water quality control measures as part of compliance with the section 10 or section 404 permit requirements, subject to water quality certification by the regional board, along with compliance with the requirements of the BCDC permit, would ensure that temporary water quality impacts related to construction activities in San Francisco Bay would be *less than significant*.

Construction of the recreational dock would avoid interference with PG&E's Offshore Sediment Area because, as shown on **Figure 4.J-2, Proposed Dock and Navigation Corridor Plan View and Cross-Sections**, no piles would be installed within the Nearshore Zone or Transition Zone Cell 16 and no dredging or excavation would occur within these areas during construction.

Abandonment of the Unit 3 Inlet and Outfall Structures and Construction of New Stormwater Outfall

Abandonment of the inlet and outfall structures associated with the Unit 3 Power Block and construction of a new stormwater outfall if a separate stormwater system is constructed would be conducted within Segments 2 and 3 of the Nearshore Zone of PG&E Offshore Sediment Area (see Figure 4.K-1 in Section 4.K, Hazards and Hazardous Materials). These in-water construction activities have the potential to penetrate the cap in the nearshore sediment zone and expose contaminated sediments beneath the cap.

PG&E anticipates completion of the offshore sediment remediation by the first quarter of 2020, before much of the construction would occur under the proposed project. PG&E's plans for

remediation in the Nearshore Zone include dredging to remove the sediments with the highest polynuclear aromatic hydrocarbon concentrations and placing a cap to isolate the remaining sediments. Within Segment 2, the cap will also include a chemically reactive layer to prevent the migration of dissolved polynuclear aromatic hydrocarbons from the sediment to the waters of the San Francisco Bay.

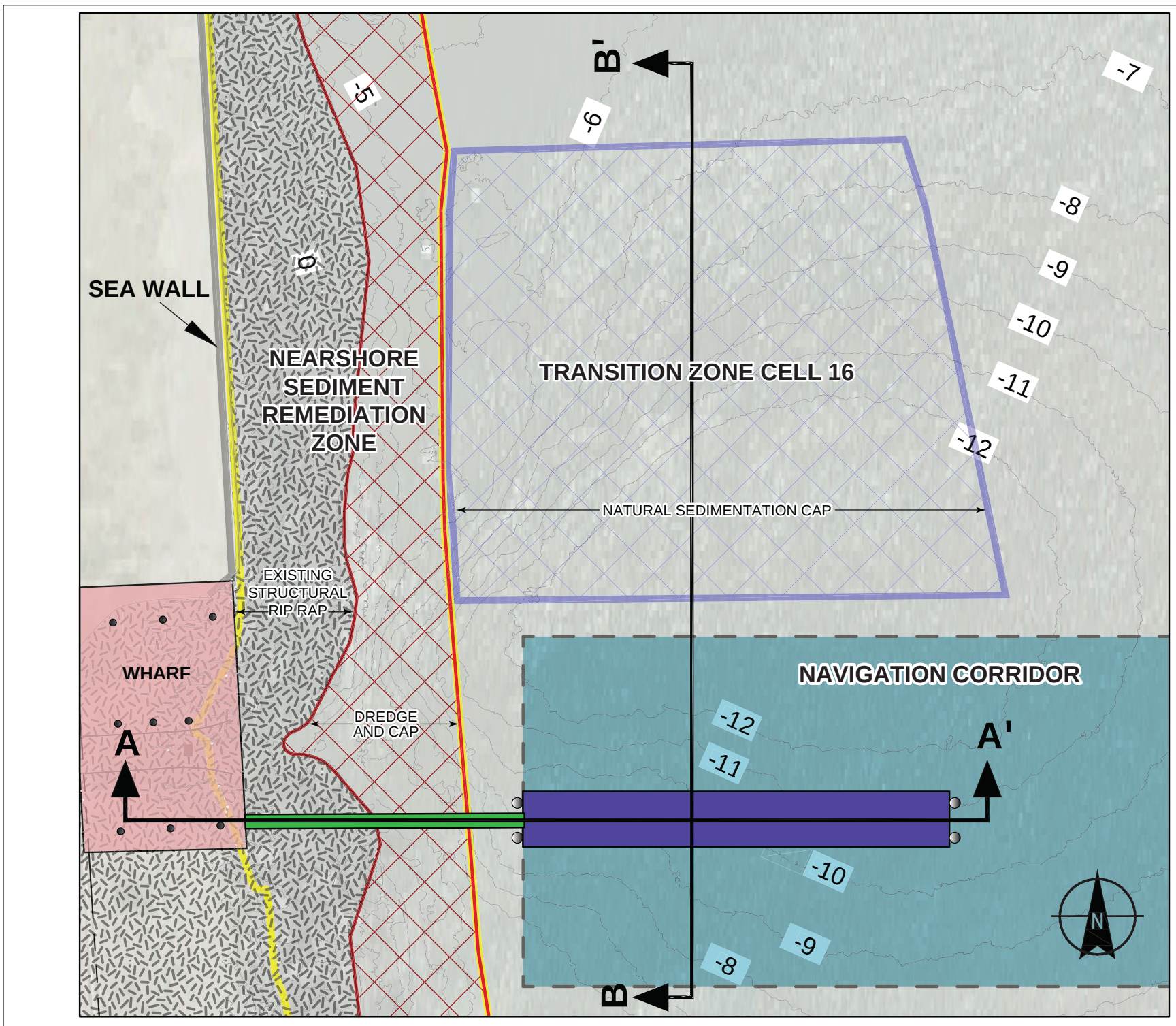
The Offshore Sediment Risk Management and Monitoring Plan to be prepared by PG&E will include requirements for conducting intrusive activities that may encounter affected sediments and will require restoration of the cap at the completion of construction. Such requirements will address notification, oversight, cap restoration, and sediment management procedures. The Offshore Sediment Risk Management and Monitoring Plan will be subject to approval by the regional board, and implementation of the specified requirements would ensure that adverse water quality effects would not occur as a result of disruption of PG&E's Offshore Sediment Area during construction. PG&E expects to complete the Risk Management and Monitoring Plan by 2020, prior to implementation of project-related construction activities within PG&E's Offshore Sediment Area. Therefore, this impact would be *less than significant*.

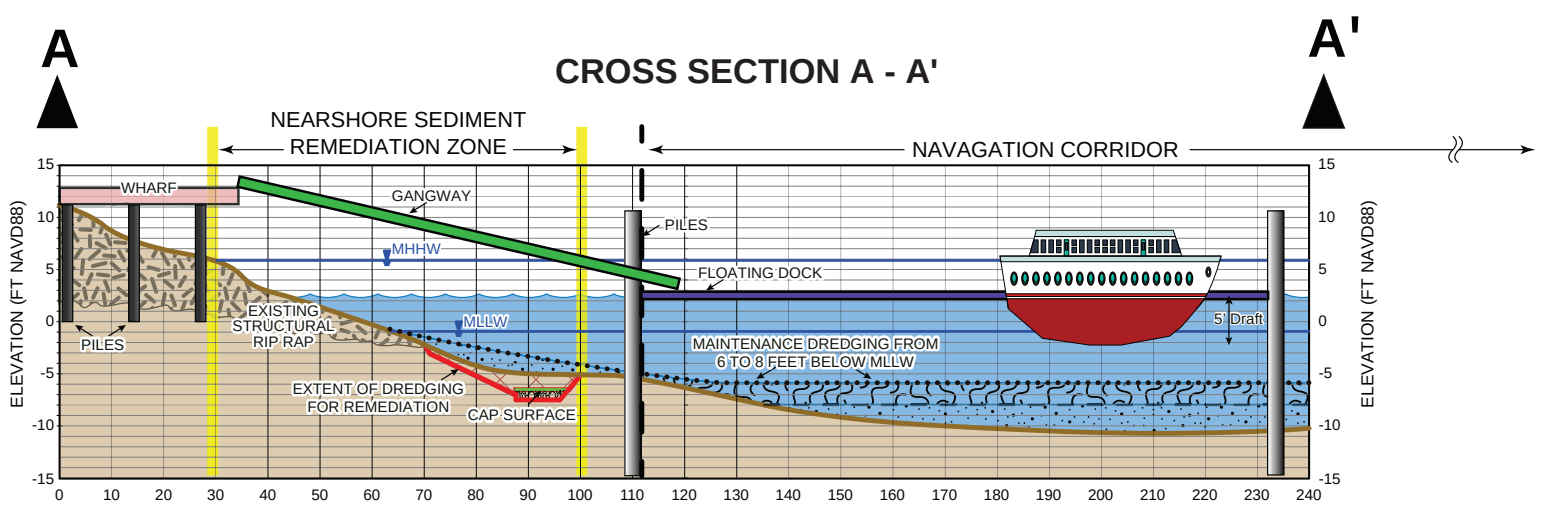
Water Quality Effects of Dewatering Activities

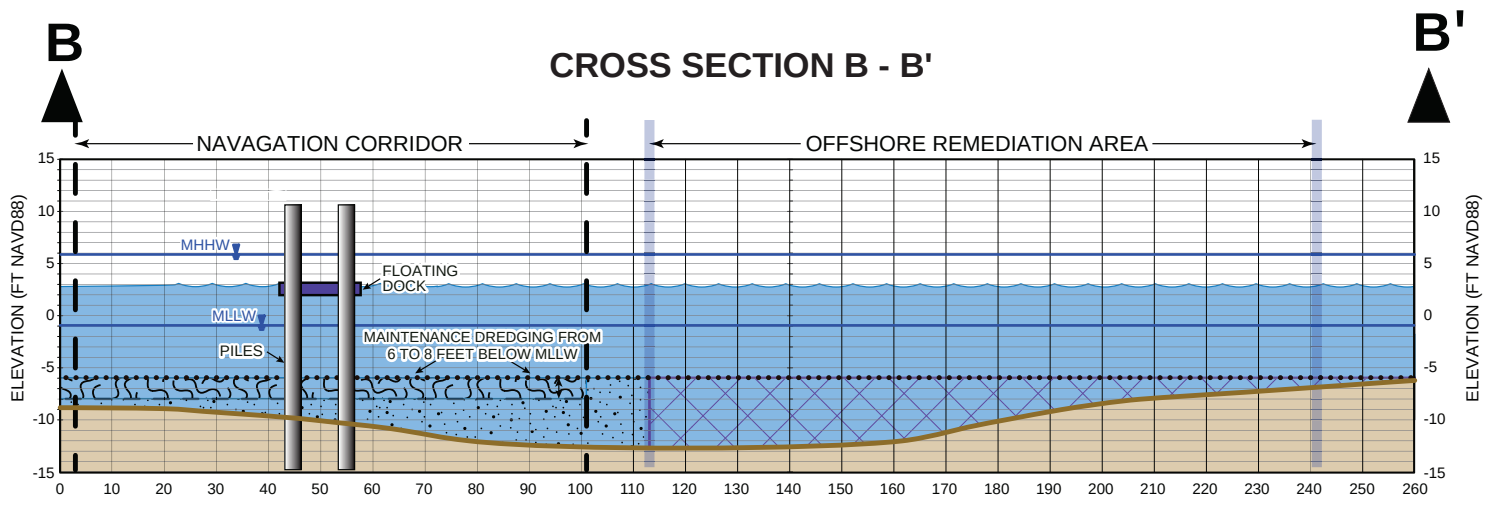
As noted in Appendix B, Initial Study, under Geology and Soils, the existing groundwater levels southwest of the historic shoreline are 7 to 9 feet below ground surface. Groundwater depths east of the historic shoreline have ranged between approximately 5 to 13 feet below existing ground surface. Given that the estimated depth of excavation on the site would be up to 25 feet for the construction of foundations, basements, and/or parking structures, temporary construction-related dewatering would be required.

The project sponsor has evaluated two options for discharge of groundwater produced during construction dewatering: (1) directly discharging to the City's combined sewer system; and (2) installing an onsite dewatering treatment system and discharging the treated water to San Francisco Bay. If discharged to the combined sewer system, groundwater discharges would be subject to article 4.1 of the public works code, as supplemented by Public Works Order No. 158170, which regulates the quantity and quality of discharges to the combined sewer system. In accordance with article 4.1 and Public Works Order No. 158170, the discharger would be required to obtain a permit for the discharges and the permit would contain appropriate discharge standards. The permit may also require installation of meters to measure the volume of the discharge.

The groundwater could contain contaminants related to past site activities, as discussed in Section 4.K, Hazards and Hazardous Materials, as well as sediment and suspended solids, but the groundwater dewatering effluent would be treated as necessary to meet the discharge limitations of article 4.1 and Public Works Order No. 158170. Treatment could include methods such as using settling tanks to remove sediments; filters to remove suspended solids; and other methods to meet chemical-specific discharge limitations. The chemical-specific treatment method used would depend on the chemicals that exceed the specified discharge limitations, but could include methods such as filtration or activated carbon treatment to reduce chemical concentrations as necessary to meet permit requirements prior to discharge.







Legend

- AGGREGATE CAP
- EXISTING STRUCTURAL RIP RAP
- ANTICIPATED SEDIMENTATION
- MAINTENANCE DREDGING
- DREDGE AND CAP AREA
- MONITORED NATURAL SEDIMENT COVER
- EXISTING SEDIMENT SURFACE
- PROPOSED CAP SURFACE
- PROPOSED EXCAVATION SURFACE

1. MEAN LOWER LOW WATER (MLLW) -1.0 FT NAVD88.
2. MEAN HIGHER HIGH WATER (MHHW) 5.6 FT NAVD88.
3. VERTICAL DATUM IS NAVD88.
4. SOURCE: HALEY & ALDRICH, INC., 2016.

DRAFT

SCALE 0 30 Feet

SOURCE: Geosyntec Consultants

Potrero Power Station Mixed-Use Development Project

Figure 4.J-2
Proposed Dock and Navigation Corridor Plan View and Cross-Sections

This page intentionally left blank

If discharged directly to San Francisco Bay, the groundwater discharges could be subject to permitting requirements of the regional board under the Groundwater General Permit or the Volatile Organic Compound and Fuel General Permit that are described above under "State Regulations," p. 4.J-21. These permits specify water quality criteria and monitoring requirements for discharges of extracted groundwater. Accordingly, under this option, the project sponsor would be required to submit a notice of intent to the regional board describing the proposed discharge and treatment system. The regional board must issue an authorization to discharge once it is determined that the discharger is eligible to discharge under the permit. Per regional board requirements, the contractors would install an onsite treatment system(s) as needed to comply with the effluent limitations of the applicable discharge permit. The treated water would likely be discharged through a temporary discharge structure and regular influent and effluent water quality monitoring would be conducted to demonstrate permit compliance. Alternatively, an individual NPDES permit from the regional board would be required, which would likely impose similar requirements.

With discharge to the combined sewer system or San Francisco Bay in accordance with the regulatory requirements described above, water quality impacts related to a violation of water quality standards or degradation of water quality due to discharge of groundwater produced during construction-related dewatering would be *less than significant*.

Water Quality Effects of Groundwater Dewatering Wells

If groundwater wells are required for construction dewatering, the wells could provide a downward conduit for contamination, potentially affecting groundwater quality, if not properly constructed. However, the project sponsor would be required to obtain a well construction permit for any dewatering wells in accordance with the well permitting requirements described above under "Well Permitting Requirements." The permit would specify requirements for construction of the wells in accordance with the water well standards of the state and article 12B of the health code, including requirements for placement of a seal around the wells, referred to as an annular seal, to prevent the downward migration of contaminants. This would ensure that any wells installed for construction-related dewatering would not provide a downward conduit for contamination that could adversely affect groundwater quality. Therefore, water quality impacts associated with installation and operation of the dewatering wells would be *less than significant*.

Impact Summary

Impact HY-1 discusses the water quality impacts of project-related construction activities as a result of land-based construction activities, in-water construction activities, groundwater dewatering, and use of groundwater dewatering wells. These impacts would be less than significant through compliance with legal requirements as implemented through numerous permits. These legal requirements include article 4.2 of the public works code, section 146; the Construction General Stormwater Permit; section 10 of the Rivers and Harbors Act and/or section 404 of the Clean Water Act; article 4.1 of the public works code; the Groundwater General Permit or the Volatile Organic Compound and Fuel General Permit; and article 12B of the health code.

Abandonment of the inlet and outfall structures associated with the Unit 3 Power Block and construction of a new stormwater outfall if a separate stormwater system is constructed would be

conducted within Segments 2 and 3 of the Nearshore Zone in the PG&E Offshore Sediment Area. Construction activities under the proposed project would be required to implement the above legal requirements and the legal requirements of PG&E's Offshore Sediment Risk Management and Monitoring Plan. Therefore, compliance with applicable regulatory requirements and implementation of specified control measures would ensure that water quality impacts associated with project construction activities would be ***less than significant***.

Mitigation: None required.

Operational Impacts

Impact HY-2: Operation of the proposed project would not violate a water quality standard or waste discharge requirement or otherwise substantially degrade water quality, and runoff from the proposed project would not exceed the capacity of a storm drain system or provide a substantial source of stormwater pollutants. ***(Less than Significant)***

The proposed project includes two options for stormwater management: a dual sewer system and a combined sewer system option. Under the dual sewer system (the preferred option), a new separate stormwater system would be constructed to convey stormwater flows from the eastern part of the site to a new outfall located near the existing Unit 3 inlet structure that would discharge stormwater to Lower San Francisco Bay. Stormwater runoff from the western portion of the project site would be conveyed to the city's combined sewer system. If the combined sewer system option is constructed, stormwater from the entire project site would be conveyed to the combined sewer system. Under both options, wastewater from the entire site would be conveyed to the Southeast Plant for treatment via the City's combined sewer system. The effects of each option on water quality and storm drain system capacity are discussed below.

Water Quality Effects of Stormwater Discharges to Separate Stormwater System and Additional Sources of Polluted Runoff

As discussed in Chapter 2, Project Description, under the preferred project (dual system option), future development on the eastern portion of the project site would discharge stormwater to a new separate stormwater system to be constructed under the proposed project. Runoff from the project site could entrain common urban stormwater pollutants such as animal waste, litter, metals, oil and grease, and other potential pollutants. However, because the proposed separated stormwater system would be designed and operated in compliance with regulations designed to protect water quality, these discharges would not violate water quality standards, otherwise degrade water quality, or result in an additional source of stormwater pollutants. All discharges would be in accordance with City regulatory requirements (discussed under "Local Regulations") that have been developed to ensure compliance with the Small MS4 General Stormwater Permit.

Stormwater runoff from the project site to the separate stormwater system would be managed in accordance with article 4.2 of the San Francisco Public Works Code, section 147, and the Stormwater Management Requirements and Design Guidelines. These requirements apply to individual projects that create or replace 5,000 square feet or more of impervious surfaces. Small

projects (between 2,500 and 5,000 square feet) that discharge to a separate stormwater system must implement one or more Site Design Measure(s) (e.g., tree planting and preservation, permeable pavement, green roofs, vegetated swales, rainwater harvesting, etc.). Large projects, including the proposed project, that create and/or replace 5,000 square feet or more of impervious surfaces must implement source controls and best management practices to meet performance requirements, and must manage runoff from the 90th percentile, 24-hour storm.

As discussed in Chapter 2, Project Description, the proposed project would primarily use two low impact development approaches for treating stormwater discharges: (1) maximizing the amount of pervious area by including rainwater harvesting and reuse systems, bio-filtration features, green roofs where feasible, and permeable surfaces; and (2) reuse of stormwater for non-potable uses such as irrigation and toilet flushing.[57] Although infiltration of stormwater is also an allowable method of stormwater management, it is unlikely that infiltration is a feasible approach for portions of the project site because of the presence of shallow bedrock and Bay Mud. However, selection of the appropriate best management practices would be guided by existing site conditions, design and development goals, and the pollutants of concern at the site.

Implementation of source control best management practices in accordance with article 4.2 of the San Francisco Public Works Code, section 147, would also reduce potential pollutant loads in the stormwater runoff and would improve the quality of the runoff to the separate stormwater system. Source control measures described in the Stormwater Management Requirements and Design Guidelines include covering and hydraulically isolating pollutant generating activities, implementing maintenance activities such as regular sweeping of exposed areas, and using non-polluting building and maintenance materials. Treatment best management practices to be implemented under the proposed project would further reduce pollutant loads in stormwater via infiltration and biofiltration. One or more treatment best management practices would be required to address each of the potential stormwater pollutants of concern.

The Stormwater Control Plan to be prepared in accordance with the Stormwater Management Requirements and Design Guidelines would describe best management practices that would be implemented to achieve the specified stormwater treatment as well as a plan for post-construction operation and maintenance of the best management practices. The plan must be reviewed and approved by the SFPUC to certify compliance with the Stormwater Design Guidelines, and the SFPUC would inspect the installed stormwater best management practices (stormwater controls) once they are constructed to confirm that they perform as designed.

Article 4.2 of the San Francisco Public Works Code, section 147, and the Stormwater Management Requirements and Design Guidelines implement the stormwater treatment requirements of the Small MS4 General Stormwater Permit. Therefore, project-related stormwater discharges to the separate stormwater system would not cause a violation of water quality standards or waste discharge requirements, would not otherwise substantially degrade water quality, and would not provide an additional source of polluted runoff. This impact would be *less than significant* for discharges to the separate stormwater system.

[57] CBG, Inc., Conceptual Stormwater Management Plan, February 2, 2018.

Portions of the project site would continue to drain stormwater to the City's combined sewer system. Water quality impacts related to these discharges would be the same as those discussed below under "Water Quality Effects of Stormwater Discharges to the Combined Sewer System and Additional Sources of Polluted Runoff."

Water Quality Effects of Stormwater Outfall Discharges to San Francisco Bay from Separate Stormwater System

Under the preferred project (dual sewer system option), stormwater flows from the eastern portion of the project site would be conveyed to a new outfall on the east side of the project site, and stormwater would be discharged through this outfall to Lower San Francisco Bay (north of the Unit 3 Power Block intake structure, within Segment 2 of PG&E's Offshore Sediment Area Nearshore Zone). Prior to construction and operation of the proposed new outfall, PG&E will have completed remediation of the Nearshore Zone that includes dredging to remove the sediments with the highest polynuclear aromatic hydrocarbon concentrations and placing a cap to isolate the remaining sediments. In Segment 2, the cap will include a chemically reactive layer to prevent the migration of dissolved polynuclear aromatic hydrocarbons through the cap. If stormwater flows from the project site eroded the cap and exposed contaminated sediments, the polynuclear aromatic hydrocarbons could be released into the bay water and potentially result in adverse water quality effects. However, as discussed in Chapter 2, Project Description, the stormwater outfall would be designed to dissipate stormwater flows in a manner to avoid scour and erosion of the sediment cap, and this would prevent a release of polynuclear aromatic hydrocarbons. Therefore, operational impacts related to the discharge of stormwater from the dual sewer system would be *less than significant*.

Water Quality Effects of Stormwater Discharges to the Combined Sewer System and Additional Sources of Polluted Runoff

As discussed in Chapter 2, Project Description, under the preferred project (dual system option), future development on the western portion of the project site would discharge stormwater to the City's combined sewer system. Under the combined sewer system option, stormwater from the entire project site would discharge stormwater to the City's combined sewer system. Runoff from the project site could entrain common urban stormwater pollutants such as animal waste, litter, metals, oil and grease, and other potential pollutants. However, these discharges would not violate water quality standards, otherwise degrade water quality, or result in an additional source of stormwater pollutants because all discharges would be in accordance with City regulatory requirements (discussed under "Local Regulations" p. 4.J-27) that have been developed to ensure compliance with the Bayside NPDES permit.

Stormwater discharges to the combined sewer system would be subject to article 4.2 of the public works code, section 147 and the San Francisco Stormwater Management Requirements and Design Guidelines that apply to future development projects that create and/or replace 5,000 square feet or more of impervious surfaces, including the proposed project. Covered projects that include more than 50 percent existing impervious surfaces must reduce the stormwater runoff flow rate and volume from the site by 25 percent for a two-year 24-hour storm. For covered projects with less than 50 percent existing impervious surfaces, the stormwater management approach must prevent

the stormwater runoff flow rate and volume from exceeding existing conditions for the one- and two-year 24-hour design storm. Alternatively, if site conditions, such as shallow bedrock in portions of the project site, limit infiltration of stormwater, the project sponsor may apply for modified compliance with the Stormwater Management Ordinance and Stormwater Design Guidelines to adjust the amount by which the project must reduce the stormwater runoff volume and flow rate relative to existing conditions.

The Stormwater Management Requirements and Design Guidelines require the use of the low-impact development measures to reduce runoff and to reduce and delay the volumes of discharge entering the combined sewer system, thereby reducing the frequency of combined sewer overflows, minimizing flooding effects, and protecting water quality. As discussed in Chapter 2, Project Description, the proposed project would primarily use two Low Impact Development approaches for treating stormwater discharges: (1) maximizing the amount of pervious area by including rainwater harvesting and reuse systems, bio-filtration features, green roofs where feasible, and permeable surfaces; and (2) reuse of stormwater for non-potable uses such as irrigation and toilet flushing.[58] Although infiltration of stormwater is also an allowable method of stormwater management, it is unlikely that infiltration is a feasible approach for portions of the project site because of the presence of shallow bedrock and Bay Mud. However, selection of the appropriate stormwater controls would be guided by existing site conditions, design and development goals, and the pollutants of concern at the site.

Article 4.2 of the public works code, section 147, also requires implementation of source control measures that would reduce potential pollutant loads in the stormwater runoff. Source control measures described in the Stormwater Management Requirements and Design Guidelines include covering and hydraulically isolating pollutant generating activities, implementing maintenance activities such as regular sweeping of exposed areas, and using non-polluting building and maintenance materials. Treatment systems as part of the stormwater controls to be implemented under the proposed project would further reduce pollutant loads in stormwater via infiltration and biofiltration. One or more treatment controls would be required to address each of the potential stormwater pollutants of concern.

The stormwater control plan to be prepared in accordance with the Stormwater Management Requirements and Design Guidelines would describe stormwater controls that would be implemented to achieve the specified reduction in stormwater flow rates and volumes as well as a plan for post-construction operation and maintenance of the controls. The plan must be reviewed and approved by the SFPUC to certify compliance with the Stormwater Management Requirements and Design Guidelines, and the SFPUC would inspect stormwater controls once they are constructed to confirm that they perform as designed.

All stormwater discharges to the combined sewer system would be treated at the Southeast Plant and Bayside wet-weather facilities in compliance with the Bayside NPDES permit. Therefore, project-related stormwater discharges to the combined sewer system would not cause a violation of water quality standards or waste discharge requirements, would not otherwise substantially

[58] CBG, Inc., Conceptual Stormwater Management Plan, February 2, 2018.

degrade water quality, and would not provide an additional source of polluted runoff. This impact would be *less than significant* for discharges to the combined sewer system.

Water Quality Effects of Wastewater Discharges to the Combined Sewer System

Both the dual system and combined sewer system options would involve discharges of wastewater to the City's combined sewer system. These discharges would not violate water quality standards or otherwise degrade water quality because all discharges would be in accordance with City regulatory requirements (discussed under "Local Regulations" p. 4.J-27) that have been developed to ensure compliance with the Bayside NPDES permit. Wastewater discharges from the proposed project would be subject to the permit requirements of article 4.1 of the San Francisco Public Works Code as supplemented by Public Works Order No. 158170. Accordingly, future commercial users of the site would be required to develop and implement a pollution prevention program and comply with the pretreatment standards and discharge limitations specified in article 4.1. These dischargers would also be required to monitor the discharge quality for compliance with permit limitations.

All wastewater discharges to the combined sewer system would be treated at the Southeast Plant and Bayside wet-weather facilities in compliance with the Bayside NPDES permit. Therefore, project-related wastewater discharges to the combined sewer system would not cause a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality. This impact would be *less than significant*.

Water Quality Effects Related to Exceeding the Capacity of the Stormwater System

Neither of the stormwater management options would result in stormwater runoff that would exceed the capacity of the stormwater conveyance system because, as described in Appendix B, Initial Study, under Utilities and Service Systems, the new stormwater systems would be constructed in accordance with the City's Subdivision Regulations. Accordingly, the new separate stormwater system and components of the combined sewer system would be sized to accommodate the 5-year storm, and flows for the 100-year storm would be directed to San Francisco Bay via streets and other approved corridors that would be designed to accommodate 100-year flood flows exceeding the 5-year storm flows in accordance with the subdivision regulations. Therefore, water quality effects related to exceeding the capacity of the stormwater system would be *less than significant*, and no mitigation is necessary.

While compliance with the specified design criteria for sizing of the stormwater system would ensure that the stormwater flows to the combined system would be within the capacity of the new system, increases in total wastewater plus stormwater flows to the City's combined sewer system could potentially increase the number of combined sewer discharges from the Islais Creek watershed of the City's combined sewer system. This would not constitute an exceedance of the stormwater system capacity, but could affect conditions subject to the Bayside NPDES permit requirements. The potential for this to occur is addressed below in this impact analysis under the subheading "Water Quality Effects Related to Changes in Combined Sewer Discharges," below.

Water Quality Effects Related to Changes in Combined Sewer Discharges

The proposed project is located in the eastern basin of the City's combined sewer system, within the Islais Creek watershed. Two aspects of the project in combination could result in long-term changes in the volume of discharges to the City's combined sewer system in these sub-basins: (1) new residents, employees, and visitors would increase the amount of wastewater generation, and (2) changes in the areas discharging stormwater to the combined sewer system would change the volume of stormwater discharges.

As discussed in "Environmental Setting," starting on p. 4.J-1 during wet weather, combined sewer system flows in excess of the combined 400 mgd capacity of the Southeast Plant and Northpoint Wet Weather facility are discharged through combined sewer discharge structures. In the Islais Creek watershed, the combined sewer discharge structures discharge directly to the Central Basin of Lower San Francisco Bay at Mariposa Street and to Islais Creek via five combined sewer discharge structures. In addition, a small amount of stormwater flows from the project site would be conveyed to the 20th Street sub-basin to the north. Combined sewer discharge structures in this sub-basin discharge to the Central Basin of Lower San Francisco Bay at 20th and 22nd streets. All of these discharge facilities are designed to result in a long-term average of no more than ten overflow events per year. The excess flows receive "flow-through treatment" in the City's storage and transport boxes to remove settleable solids and floatable materials. However, an increase in the frequency of combined sewer discharges could be a concern because the regional board has designated Islais Creek, the Central Basin of Lower San Francisco Bay and Lower San Francisco Bay as impaired water bodies under section 303(d) of the Clean Water Act, which indicates water quality standards are not expected to be met after implementation of technology-based effluent limitations, and because combined sewer discharges contain pollutants for which these water bodies are impaired.

The dual stormwater system would decrease the project area that discharges to the combined sewer. Under the combined sewer option, the entire 21-acre site would discharge stormwater to the combined sewer system. The SFPUC analyzed the potential effect of changes in wastewater and stormwater flows under the proposed project for the combined sewer option.[59] This option would have the greatest potential to result in an increase in the frequency of combined sewer discharges because under this option, all of the stormwater from the project site would be discharged to the combined sewer system. The SFPUC analysis found that the combined sewer system option would not result in an increase in the frequency of combined sewer discharges from the Islais Creek watershed or 20th Street sub-basin. The volume of discharges would increase slightly at the Islais North, Marin Street, Selby Street, and Third Street outfalls, all of which discharge to Islais Creek. The effect of the dual system would be less than modeled because the proposed project would decrease the portion of the site that discharges stormwater to the combined sewer system under the dual system option. This SFPUC analysis accounts for the Pier 70 Mixed-Use District project and the Golden State Warriors Event Center and Mixed-Use Development project, which are both under construction. Because stormwater and wastewater discharges from the project would not result in an increase in the frequency of combined sewer discharges under either stormwater management option, the project's impacts related to changes in combined sewer discharges would be *less than significant*.

[59] San Francisco Public Utilities Commission, Memorandum from Julio Maravilla to Titus Chen, Potrero Power – System Type Determination Modeling, October 11, 2017 (rev 1).

Water Quality Effects Related to Changes in Bay Circulation

The float for the proposed recreational dock would utilize either four 36-inch diameter steel piles or 14 24-inch diameter concrete piles. Installation of new piles has the potential to affect the speed and direction of currents in the bay and could result in associated changes in sediment transport, water quality, and salinity. However, based on numerical modeling for nearby projects, any potential changes in these factors caused by the installation of the recreational dock structures is expected to be confined to the immediate vicinity of the structures and would be unlikely to have a discernable effect on overall circulation and water quality along the bay shoreline.

Numerical modeling of water circulation in San Francisco Bay was performed for the 34th America's Cup EIR[60] and for a remediation concept design and impact analysis within Central Basin at Crane Cove Park.[61] The 34th America's Cup project included the construction of new structures on a pier supported with the addition of 1,750 new piles, many more than would be installed under the proposed project. The Crane Cove Park project included the removal of Wharf 8 from the Central Basin of San Francisco Bay; installing Crane Cove Park Beach, and deepening Dredge Units 1-3 in Central Basin to a depth of 35 feet mean lower low water.[62] The modeling evaluated the effects of the proposed improvements on water circulation, and the subsequent effects on sediment transport, water quality, and salinity. While these models did not analyze the specific effects of the new piles to be constructed under the proposed project, they do provide general indicators of the potential for changes in circulation to occur as a result of the installation of new piles.

The models concluded that structures and other improvements have the potential to induce changes to the speed and direction of currents. However, these effects would be restricted to the immediate vicinity of the structures and would only occur during stronger currents. At times of low currents, changes are expected to be negligible because sediment transport, salinity and water quality along the San Francisco waterfront are driven almost entirely by tidal currents. Further, wind and wind-waves, which cause mixing, would be expected to further reduce the potential effects of the proposed facilities on the bay tidal currents, sediment transport, salinity and water quality. Therefore, any potential changes in these factors caused by the installation of the recreational dock structures is expected to be confined to the immediate vicinity of the structures.

For the reasons described above, impacts related to changes in water circulation would be *less than significant* for the proposed project.

Water Quality Effects Related to Maintenance Dredging

Maintenance dredging could be required to maintain a minimum 6-foot water depth within the navigation corridor (shown on Figure 4.J-2) for vessels using the new recreational dock. Based on the current depth of the bay within the navigation corridor and information regarding the current rate of sedimentation, maintenance dredging is not expected to be required until 2050. Any maintenance dredging after that time would be infrequent, and would be limited to a maximum

60 Coast & Harbor Engineering, *Draft Coastal Harbor Engineering Impact Analysis, 34th America's Cup, San Francisco Bay*, June 14, 2011.
61 Coast & Harbor Engineering, *Technical Report Coastal Engineering Analysis, Remediation Concept Design and Impact Analysis. Port of San Francisco Central Basin California*. Prepared for Port of San Francisco, November 4, 2014.
62 Ibid.

water depth of 8 feet at the mean lower low water elevation to accommodate recreational boat traffic. The project sponsor would implement the water quality measures described in Chapter 2, Project Description, including confining dredging operations to approved work windows, which would reduce water quality effects related to maintenance dredging. Further, the maintenance dredging would be conducted in accordance with a section 10 permit from the Corps and a 401 Water Quality Certification from the regional board as well as the requirements of other permitting agencies of the Dredged Material Management Office including the U.S. EPA, BCDC, State Lands Commission, National Marine Fisheries Service, and California Department of Fish and Wildlife. With implementation of these regulatory requirements, water quality impacts related to maintenance dredging would be *less than significant*.

Maintenance dredging would be conducted within a zone that is approximately 10 feet south of Transition Zone Cell 16 of PG&E's Offshore Sediment Remediation Area. PG&E's remedial approach for this cell relies on natural sedimentation processes to isolate and bury contaminated sediment beneath clean sediment. This process results in the accumulation of up to a six-foot-thick layer of clean sediment on top of the existing sediment, which isolates the contaminated sediment from the bay waters. Maintenance dredging would not extend beyond the northern limit of the navigation corridor shown on Figure 4.J-2, which would be a minimum of 10 feet south of Cell 16.[63] Therefore, maintenance dredging would not disrupt the natural sedimentation processes that support the remediation of Transition Zone Cell 16.

Water Quality Effects Related to Littering

The proposed use of the project site by residents, employees, and visitors could increase the potential for litter entering the bay. This is a potential water quality issue because the adjacent Lower San Francisco Bay is listed as impaired for trash (see "State Regulations" starting on p. 4.J-21). In accordance with article 6 of the San Francisco Health Code, Garbage and Refuse, the project sponsor would be required to place containers in appropriate locations for the collection of refuse. In accordance with this article, the refuse containers must be constructed with tight fitting lids or sealed enclosures, and the contents of the container may not extend above the top of the rim. The project sponsor must also have adequate refuse collection service. Further, article 6 prohibits the dumping of refuse onto any streets or lands within San Francisco.

The proposed project would be required to comply with several City ordinances, discussed in the Appendix B, Initial Study, under Utilities and Service Systems, which would decrease the amount of non-degradable trash generated under the proposed project. The San Francisco Mandatory Recycling and Composting Ordinance requires facilities to separate their refuse into recyclables, compostables, and trash. In addition, the Food Service Waste Reduction Ordinance prohibits any establishment that serves food prepared in San Francisco from using polystyrene foam (Styrofoam) to-go containers. This ordinance also requires that any containers used in the City's programs be either recyclable or compostable.

Further, if a separate stormwater system were to be constructed, the proposed project would be required to comply with the Trash Amendment of the Water Quality Control Plan for Inland

[63] Simpson, Gumpertz, and Heger, *Sediment Transport Analysis for the Proposed Berthing Facility*, February 7, 2018.

Surface Waters, Enclosed Bays, and Estuaries of California, described above under "Inland Surface Waters, Enclosed Bays, and Estuaries Plan." This amendment would require the proposed project to implement specific measures to prevent the transport of trash to San Francisco Bay. Compliance with this requirement may be achieved using a full capture system for all storm drains (Track 1) or a combination of full capture systems, multi-benefit projects, other treatment controls, and institutional controls (Track 2).

Compliance with article 6 of the San Francisco Health Code, the City ordinances described above, and the Trash Amendment for the separate stormwater system, would reduce the amount of non-recyclable and non-compostable wastes produced at the project site, would ensure that adequate containers and refuse service are provided, and would ensure that offshore San Francisco Bay water is kept free of trash as a result of littering at the project site. This would reduce the potential for transport of litter to the combined or separate stormwater systems and directly to San Francisco Bay via wind or stormwater runoff. Therefore, water quality impacts related to littering would be *less than significant*.

Impact Summary

Impact HY-2 discusses the water quality impacts associated with operation of the proposed project, including the water quality effects of stormwater and wastewater discharges, additional sources of polluted runoff, the potential to exceed the capacity of the storm drain system, and littering. These impacts would be less than significant through compliance with legal requirements as implemented through numerous permits. These legal requirements include article 4.2 of the San Francisco Public Works Code, section 147; the Stormwater Management Requirements and Design Guidelines; article 4.1 of the San Francisco Public Works Code as supplemented by Public Works Order No. 158170; the City Subdivision Regulations; article 6 of the San Francisco Health Code; and the Trash Amendment of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

Similarly, water quality impacts related to maintenance dredging would be less than significant through compliance with legal requirements as implemented through permitting. These legal requirements include section 10 of the Rivers and Harbors Act; section 401 of the Clean Water Act; and the requirements of the permitting agencies of the Dredged Material Management Office including the U.S. EPA, BCDC, State Lands Commission, National Marine Fisheries Service, and California Department of Fish and Wildlife.

Based on modeling performed in support of the proposed project, the proposed project would not result in an increase in the frequency of combined sewer discharges from the City's combined sewer system. Water quality effects related to changes in circulation are expected to be restricted to the immediate vicinity of the piles that would be installed to support the new recreational dock. Therefore, water quality impacts related to these topics would be ***less than significant***.

Mitigation: None required.

Impact HY-3: The proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion, siltation, or flooding on or off site. ***(Less than Significant)***

Stormwater runoff from the eastern portion of the project site currently drains to the existing onsite separate storm drain system, and stormwater runoff from the western portion of the project site drains to the city's combined sewer system. The project site does not include any existing streams or water courses that could be altered or diverted. Therefore, the proposed project would have no impact related to alteration of drainage patterns by altering the course of a stream in a manner that would cause erosion, flooding, or siltation on or offsite.

Under the proposed project, stormwater would be routed either to a new separate stormwater system or the City's combined sewer system. In accordance with the Stormwater Management Requirements and Design Guidelines, stormwater controls for future development projects that discharge to the new separate stormwater system would be designed to treat rainfall from the 90th percentile, 24-hour storm and include measures to reduce or eliminate downstream water pollution. In areas served by the combined sewer system, article 4.2 of the San Francisco Public Works Code, section 147, and the Stormwater Management Requirements and Design Guidelines would require that the stormwater controls for individual development projects reduce or maintain existing stormwater runoff flow rates and volumes. Further, as described above in Impact HY-2, the new separate stormwater system and components of the combined sewer system would be sized to accommodate the 5-year storm, and flows for the 100-year storm would be directed to San Francisco Bay via streets and other approved corridors that would be designed to accommodate 100-year flood flows in excess of the 5-year storm in accordance with the subdivision regulations. Compliance with these design requirements, subject to approval by Public Works, would ensure that no on- or off-site flooding, erosion, or siltation would occur.

Therefore, neither alteration of existing drainage patterns at the project site nor changes in stormwater runoff volumes would result in substantial erosion, siltation, or flooding on- or off-site, and this impact would be ***less than significant***.

Mitigation: None required.

Impact HY-4: Operation of the proposed project would not place housing within a 100-year flood zone or place structures within an existing 100-year flood zone that would impede or redirect flood flows. ***(Less than Significant)***

As discussed above under "Existing Flood Zones," p. 4.J-7 the shoreline portions of the project site are located within a 100-year flood zone identified on the City's 2008 Interim Flood Hazard Maps. However, the proposed project includes construction of shoreline protection improvements, including rock slope revetments, wetlands, berms and bulkheads along the entire waterfront of the project site to protect the waterfront from the damaging effects of wave action. The inland grade near the shoreline would also be increased. The entire waterfront portion of the project site would

be raised to an elevation of 17.5 feet NAVD88, which is above the existing 100-year flood elevation of 11 to 12 feet NAVD88. The final slopes along the waterfront would be similar to existing conditions.

Factors that could exacerbate flooding issues along the waterfront portion of the project site include changes in the shape and configuration of the shoreline as well as construction of in-bay structures or enclosures such as jetties, breakwaters, or marinas that could change circulation patterns in San Francisco Bay in the vicinity of the project site. Because the final slope and shape of the shoreline along the waterfront portion of the project site would be substantially the same as existing conditions and the piles for the recreational dock would not substantially change circulation patterns, the patterns of flood flows at the project site or in the vicinity would not be substantially affected.

The proposed project does not include additional stormwater discharges or other discharges that would increase the frequency or severity of flooding and, as discussed above in Impact HY-2, the stormwater drainage systems installed under either of the stormwater options would be sized to adequately convey stormwater flows in accordance with San Francisco's subdivision regulations. The proposed project would not cause flooding to occur in areas that would not be subject to flooding without the proposed project for the reasons stated above.

Although the proposed project includes the construction of housing, any proposed housing and other proposed structures would be constructed at least 100 feet inland from the shoreline and would not be constructed within an identified 100-year flood zone. Therefore, impacts related to placement of housing within a 100-year flood zone and the impedance or redirection of flood flows within an existing 100-year flood zone would be ***less than significant***.

Mitigation: None required.

Impact HY-5: Operation of the proposed project would not place structures within a future 100-year flood zone that would impede or redirect flood flows. ***(Less than Significant)***

Under existing conditions, site elevations range from about 12 feet NAVD88 at the top of the shoreline to 36.4 feet NAVD88 inland, closest to the western property boundary. With 66 inches of sea level rise (the upper range of sea level rise expected by 2100 as estimated by the National Research Council), mean higher high water would increase to 11.9 feet NAVD88 and only the immediate waterfront portions of the project site would be inundated; no development is proposed within this potentially flooded area. When the effects of 100-year storm surge are considered, bay water levels would temporarily increase to 15.4 feet NAVD88 and more of the project site could be temporarily flooded.

To be resilient to the upper range of sea level rise, the project sponsor would raise elevations at the shoreline by 3 to 7 feet, to a minimum elevation of 17.5 feet NAVD88, which is above the projected worst-case future flood level of 15.4 feet NAVD88 in 2100 estimated by the National Research Council. In addition, low lying portions of the project site (with the exception of the area around

the Unit 3 Power Block and the Boiler Stack) would be filled to a minimum elevation of 17.5 feet NAVD88 and the finished floor elevation of all proposed development (with the exception of the Unit 3 Power Block and the Boiler Stack) would be at a minimum elevation of 17.5 feet NAVD88, 2 feet above the worst-case future flood elevation in 2100 estimated by the National Research Council (15.4 feet NAVD88). In addition, the wharf deck for the recreational dock would be at an elevation of 17.5 feet NAVD88, also above the future flood level. The float would accommodate rising sea levels.

The ground elevation in the vicinity of the Unit 3 Power Block and the Boiler Stack is approximately 14 feet NAVD88. This area would be protected from future flooding by construction of the proposed shoreline improvements. Regardless, this area would be provided with a local pump station and backflow protection would also be integrated into the storm drain collection system to protect against flooding. The pump station would discharge stormwater from the area around the Unit 3 Power Block and the Boiler Stack to the stormwater outfall constructed as part of the separate stormwater system. A backflow prevention device would prevent bay water from entering the storm drainage system in the event of extreme tidal elevations, and this would prevent future bay water level increases from adversely affecting the operation of the storm drainage system.

As for existing flooding conditions, factors that could exacerbate flooding and increase the potential for coastal erosion along the waterfront portion of the project site include changes in the shape and configuration of the shoreline as well as construction of in-bay structures or enclosures such as jetties, breakwaters, or marinas that could change circulation patterns in San Francisco Bay at the project site. Because the final slope and shape of the shoreline along the project waterfront portion of the project site would be substantially the same as existing conditions, and the piles for the recreational dock would not substantially change circulation patterns, the patterns of future flood flows and potential for coastal erosion at the project site and in the vicinity would not be substantially affected.

The proposed project would not result in additional stormwater discharges or other discharges that would increase the frequency or severity of flooding and, as discussed above in Impact HY-2, the stormwater drainage systems installed under either of the stormwater options would be sized to adequately convey stormwater flows in accordance with San Francisco's subdivision regulations. The proposed project would not cause flooding to occur in areas that would not be subject to flooding without the proposed project for the reasons stated above. Therefore, this impact would be ***less than significant***.

Mitigation: None required.

Impact HY-6: The proposed project would not expose people or structures to substantial risk of loss, injury, or death due to inundation by seiche, tsunami, or mudflow. *(Less than Significant)*

As discussed above under "Tsunami and Seiche," p. 4.J-15, the majority of the project site is located in an area identified for potential inundation in the event of a tsunami or seiche based on existing

site grades.[64] Based on modeling conducted in support of the Tsunami Annex to San Francisco's Emergency Response Plan, the maximum elevation of a potential wave from a local source tsunami is 6.3 feet NAVD88 and the maximum elevation of a potential wave from a distant-source tsunami is 10.3 feet NAVD88.

As discussed in Chapter 2, Project Description, and in Impact HY-5, above, the project sponsor would raise elevations at the shoreline by 3 to 7 feet, to an elevation of 17.5 feet NAVD88, which is above the maximum tsunami elevation of 10.3 feet NAVD88. In addition, low lying portions of the project site (with the exception of the area around Unit 3 and the Stack) would be filled to elevations of 17.5 feet NAVD88 and the finished floor elevation of all proposed developments (with the exception of the Unit 3 Power Block and the Boiler Stack) would be at a minimum elevation of 17.5 feet NAVD88, well above the maximum tsunami elevation. In addition, the wharf deck for the recreational dock would be at an elevation of 17.5 feet NAVD88, also above the maximum tsunami elevation. While the floating dock would rest on the bay water surface, and could be affected by a tsunami, it would likely experience only slight damage because it floats on the water surface and is designed to accommodate changes in water levels. None of the proposed improvements would exacerbate conditions related to tsunami inundation, or expose additional people to loss, injury, or death as a result of tsunami inundation. Rather, the project would reduce tsunami risks to people and structures by raising the interior grades of the project site well above the projected tsunami level. This impact would be ***less than significant***.

Mitigation: None required.

Cumulative Impacts

Impact C-HY-1: The proposed project, in combination with past, present, and reasonably foreseeable future projects in the site vicinity, would not result in a considerable contribution to cumulative impacts on hydrology and water quality. *(Less than Significant)*

Water Quality Effects of On-Land and In-Water Construction

As discussed in Impact HY-1, implementation of appropriate regulatory requirements would ensure that the proposed project would result in less than significant impacts related to erosion and discharges of groundwater during construction dewatering. Other projects listed in Table 4.A-2 that could potentially contribute to a cumulative construction-related water quality impact would be subject to the same or similar regulatory requirements, including the Construction General NPDES permit, article 4.1 of the Public Works Code as supplemented by Public Works Order No. 158170, article 4.2 of the Public Works Code, section 146 (including implementation of an erosion control plan), the Groundwater General Permit, and the Volatile Organic Compound and Fuel General Permit. Similarly, all in-bay construction along the waterfront would be required to implement the requirements of section 404 and section 10 permits from the Corps that would

[64] California Emergency Management Agency, California Geological Survey, University of Southern California, *Tsunami Inundation Map for Emergency Planning, San Francisco North Quadrangle/San Francisco South Quadrangle (San Francisco Bay)*, June 15, 2009, *http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/Inundation_Maps/SanFrancisco/Documents/Tsunami_Inundation_SouthSFNorthSF_SFBay_SanFrancisco.pdf*, accessed February 24, 2018.

receive water quality certification from the regional board in accordance with section 401 of the Clean Water Act. Implementation of these requirements under each individual project would ensure that all discharges comply with regulatory standards and would not result in a violation of water quality standards, such that no cumulative adverse impact on water quality would occur. Therefore, cumulative impacts related to construction-related water quality and hydrology would be ***less than significant***. None of the cumulative projects listed in Table 4.A-2 would disrupt PG&E's Offshore Sediment Area, therefore there would be no cumulative impact related to disruption of this area.

Operational Effects on Water Quality

As discussed in Impact HY-2, stormwater discharges to either the new separate stormwater system or the City's combined sewer system would be subject to article 4.2, section 147, of the public works code, which would ensure compliance with the Small MS4 General Stormwater Permit and the Bayside NPDES permit that are described under "State Regulations." Compliance with and implementation of these regulatory standards by the proposed project as well as by all of the cumulative projects listed in Table 4.A-2 would ensure that stormwater discharges would not result in a violation of water quality standards, degrade water quality, or provide an additional source of polluted runoff. Therefore, cumulative impacts related to these impacts would be ***less than significant***.

There would be no cumulative impacts related to exceeding the capacity of the separate stormwater system because the separate system would serve the project site only, and would not accept flows from other areas.

Hydroconsult Engineers, in collaboration with the SFPUC, modeled the cumulative effects of changes in wastewater and stormwater flows on the frequency of combined sewer discharges using the same model as the SFPUC project-level analysis and adding the reasonably foreseeable future projects listed in Table 4.A-1 of this EIR.[65] The model results indicated that the cumulative changes in stormwater and wastewater flows would result in a decrease in both frequency and volume of combined sewer discharges compared with existing conditions for both the dual and combined sewer system options. This is likely primarily due to the increased storage to be provided by the SFPUC's proposed Central Bayside System Improvement Project, which would include an approximately 24-foot diameter, 2,000-foot long tunnel. Therefore, cumulative impacts related to an increase in the frequency of combined sewer discharges would be ***less than significant***.

Other reasonably foreseeable future projects that would involve construction of new structures in the bay, such as the Mission Bay Ferry Landing, would be located too far from the project site and/or would not combine on a scale relative to the surface area and volume of San Francisco Bay to have a potentially significant cumulative impact on circulation and associated sedimentation and flushing. Moreover, as discussed in Impact HY-2, the potential change in water circulation in the bay under the proposed project would be restricted to the immediate vicinity of the new

[65] Hydroconsult Engineers, Cumulative Analysis of Combined Sewer Discharges, July 9, 2018.

recreational dock. Therefore, cumulative water quality impacts related to changes in circulation and sediment flushing would be ***less than significant***.

The proposed project and any cumulative project requiring dredging would be required to implement the requirements of a section 10 permit from the Corps and a section 401 Water Quality Certification from the regional board as well as the requirements of other permitting agencies of the Dredged Material Management Office as described in Impact HY-2. Implementation of these requirements would ensure that dredging activities would not result in a violation of water quality standards, degrade water quality, or provide an additional source of polluted runoff. Therefore, cumulative impacts related dredging would be ***less than significant***.

As discussed in Impact HY-2, the proposed project's water quality impacts related to littering would be less than significant through compliance with article 6 of the health code, City ordinances addressing recycling and composting of wastes, and the Trash Amendment of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Other projects in the area are also required to comply with these requirements. Therefore, cumulative water quality impacts related to litter would be ***less than significant***.

Alteration of Drainage Patterns

As discussed in Impact HY-3, the proposed separate storm drainage system and/or the combined sewer system would be subject to compliance with established regulations, which would ensure that impacts related to alteration of drainage patterns are less than significant. Other past, present, and reasonably foreseeable future projects within the bayside drainage basin would also be subject to these regulations. Therefore, based on the City's established regulations and guidelines for the separate and combined sewer system, cumulative impacts related to alteration of drainage patterns would also be ***less than significant***.

Flooding

As described in Impacts HY-4 and HY-5, the City's bay shoreline is subject to coastal flooding and will be subject to an increased risk of flooding in the future due to anticipated climate change-induced sea level rise. However, the project has incorporated features including shoreline improvements to prevent flooding at the site. These features are subject to approval by the BCDC, as part of its permitting process. Similarly, past, present, and reasonably foreseeable future development along the bay shoreline would also be subject to BCDC permitting requirements, which would ensure that none of these projects would impede or redirect future flood flows, or exacerbate the existing flood hazard. Therefore, cumulative impacts related to existing flooding hazards and future flood hazard risks due to sea level rise would be ***less than significant***.

Tsunami

Without proper precautions, past, present, and reasonably foreseeable future project within the potential tsunami inundation zone could exacerbate the existing tsunami hazards by altering the inland topography in a way that would redirect flood flows or harshen the effects of flooding. In combination with the proposed project, the cumulative development in the potential tsunami inundation zone could result in a potentially significant cumulative impact. However, as discussed

in Impact HY-6, a tsunami or seiche would not adversely affect the project site because the proposed project would include construction of shoreline protection improvements that would raise the shoreline along the entire waterfront to an elevation of 17.5 feet NAVD88, which is well above the maximum tsunami wave height of 10.3 feet NAVD88. Therefore, the project would not contribute to any cumulative impacts related to tsunami inundation, and the project's contribution to this cumulative impact would be ***less than significant***.

This page intentionally left blank

4.K Hazards and Hazardous Materials

4.K.1 Introduction

This section addresses the potential impacts of the proposed project related to hazardous materials during construction and operation, including impacts from hazardous materials in the soil, soil vapor, and groundwater, from naturally occurring asbestos in the fill materials and bedrock at the site, and from hazardous building materials. The existing and planned risk management plans prepared by Pacific Gas and Electric Company (PG&E) and approved by the San Francisco Bay Regional Water Quality Control Board (regional board) provide a framework and protocols for the management of hazardous materials in soil, soil vapor, and groundwater during development of the project site and for existing industrial land uses at the project site. However, because the project would involve land uses different than the existing industrial uses, this analysis addresses additional risk management activities that would be required by the regional board and implemented by the project sponsor to ensure that the site is safe for future site users. Suspected hazardous building materials in the buildings to be demolished and those to be reused are also identified along with the regulatory requirements that address abatement of these materials. The potential for the proposed development to include the handling of hazardous materials, to interfere with an adopted emergency response plan or emergency evacuation plan or result in fire hazards is also addressed. Impacts related to emergency access are addressed in Section 4.E, Transportation and Circulation.

4.K.2 Environmental Setting

As discussed below, hazardous materials have been identified in the soil, groundwater, and soil vapor at the Power Station and PG&E sub-areas as a result of previous site uses (see Chapter 2, Figure 2-2, Project Site Sub-Areas and Ownership, for locations of project sub-areas). Although sampling has not been conducted within the Port, City, and Southern sub-areas, there is the potential that hazardous materials may also be present in the soil, groundwater, and soil vapor within these areas as a result of previous land uses. In addition, PG&E has identified contamination in the sediments adjacent to the bay shoreline where some in-water construction activities would occur under the proposed project. This area is referred to as the Offshore Sediment area. Remediation of hazardous materials releases has been completed at substantial portions of the project site. Additional remediation is, or may be, required to clean up the remaining portions of the project site and the Offshore Sediment area to ensure that risks to future site users and the public from the hazardous materials present are adequately managed. Naturally occurring asbestos is also present in the fill materials on the project site that include crushed Franciscan Complex bedrock.

This Environmental Setting section is organized into six main sub-sections. The first sub-section provides an overview of the site investigation and remediation process required to address potential hazardous materials releases at the project site by sub-area. The second sub-section presents a description of the site history and the current remedial status of each project sub-area; this is the most detailed sub-section. The third sub-section describes the regulatory database review conducted for

the proposed project. The fourth sub-section provides a description of hazardous materials conditions in areas adjacent to the project site. The fifth sub-section is a description of naturally occurring asbestos present at the project site. The sixth and final sub-section of the setting section is a description of hazardous building materials that may be present in the buildings to be demolished or reused under the proposed project.

Overview of Site Investigation and Remediation Process

Power Station and PG&E Sub-Areas

PG&E is responsible for the investigation and remediation of the Power Station and PG&E sub-areas, as well as the adjacent Offshore Sediment area. PG&E's remediation activities are being conducted under the oversight of the regional board, the lead agency for the remediation. As the lead agency, the regional board must review and approve all remedial planning documents. These remediation activities are not part of the proposed project, and they are proceeding independently whether or not the proposed project is approved. PG&E's cleanup program is designed to meet cleanup standards for commercial and industrial land uses. The regional board's required investigation and remedial process for these sub-areas includes the following steps:

- Characterizing the site history of each sub-area to identify buildings, facilities, processes, and waste disposal activities that may have resulted in a release of hazardous materials. This information is used to identify the types of hazardous materials that may be present in the soil, groundwater, and soil vapors[1] and to also evaluate where these materials may be located (such as the location of previous manufactured gas plant operations and associated facilities).

- Conducting a site investigation(s) that includes sampling to evaluate what hazardous materials are present in the soil, groundwater, and soil vapor quality and the concentration of those hazardous materials present.

- Conducting a human health risk assessment to evaluate risks to current or planned site users based on the concentrations of hazardous materials present and the potential for humans to be exposed to the materials. The purpose of the risk assessment is to develop health-based cleanup standards that will allow commercial and industrial land uses to take place on the property. In general, health-based standards are more restrictive for residential uses than commercial and industrial land uses (meaning that higher concentrations of hazardous materials may be left in place at sites planned for commercial or industrial uses). This is because commercial or industrial users of a site generally occupy a site during work hours while residential users may potentially occupy the site for longer periods of time and consequently be exposed to hazardous materials at the site for longer durations. In addition, residential users may include children who are more sensitive to exposure to hazardous materials.

- Where hazardous materials are present in the soil, groundwater, or soil vapors at concentrations that exceed health-based cleanup levels for commercial and industrial uses PG&E must implement appropriate remedial measures. The remedial measures may include excavating or stabilizing contaminants, although the remedial measures for most of the Power

[1] Volatile organic compounds present in soil or groundwater can vaporize into the air spaces within the soil above the groundwater table. Vapor intrusion occurs when these vapors migrate into an overlying building. If present at high enough concentrations, chemicals in the soil vapors can pose health risks to the building occupants. This is of particular concern for buildings that include basements constructed within the underlying soil.

Station and PG&E sub-areas involve the installation of a durable cover to prevent inadvertent contact with the soil. The durable cover may consist of features such as asphalt, buildings, or sidewalks. Alternatively, the durable cover can consist of clean imported soil to be placed on top of the contaminated soil.

- The remedial measures for the Power Station and PG&E sub-area also include the preparation of risk management plans for areas where hazardous materials remain in the soil, groundwater, or soil vapors at concentrations that exceed health-based cleanup levels for commercial or industrial land uses. The risk management plans specify measures to manage potential risks to humans and the environment during and after development of the site and ensure that unacceptable health risks do not occur. A land use covenant[2] must also be executed that requires implementation of the risk management measures by current and future land owners and limit future land uses at the site. In some cases, such as in the PG&E sub-area, the risk management plan is referred to as a site mitigation plan. These terms can be used interchangeably.

- Once the risk management plan has been approved and the land use covenant has been executed, the regional board issues a "no further action" letter certifying that the development site has been remediated to a level that is protective of human health and the environment for the proposed land use.

If more sensitive land uses such as residential uses are proposed, the project sponsor must conduct an additional human health risk assessment for the proposed land uses. As with the ongoing PG&E remediation activities, the project sponsor's risk assessment for more sensitive land uses must be approved by the regional board, and the site design must incorporate measures approved by the regional board for the management of site risks. To achieve clean closure of a site, such that no engineering controls are required to manage site risks, the risk assessment must demonstrate that risks to future site occupants under the proposed land uses would be an excess cancer risk of one in a million or less[3] and non-cancer risks would be a hazard index of one or less.[4]

---

2 A land use covenant is a legal instrument that imposes land use restrictions on a property to protect public health and safety and the environment. Land use covenants are commonly required by regulatory agencies as a condition of site closure at sites where the approved remediation leaves hazardous materials in the onsite soil, groundwater, or soil vapors at levels that prevent unrestricted land use. Land use covenants required as a condition of regulatory closure are enforceable by the regulatory agency, in this case, the regional board. Land use covenants can also arise from a transaction between private parties, e.g., between a seller and buyer, with the covenant enforceable by the seller. The private land use covenants applicable to this site are described below. The requirements of a land use covenant, whether enforceable by a regulatory agency or a private party, run with the land, meaning that they apply to current and future owners of the property. They remain in effect until they are formally removed or modified.

3 Risk from cancer causing substances (carcinogens) is expressed as an incremental probability of an individual's developing cancer over a lifetime due to exposure to site carcinogens. The estimate is incremental because it does not consider any other factors or exposures than those assessed in the risk assessment (such as smoking or genetic predispositions). Cancer risk is expressed as a probability; for example, one person in a million exposed to contaminants at the site has the chance of contracting cancer as a result of a lifetime of exposure.

4 Risk from non-cancer causing substances (noncarcinogens) is calculated by comparing the exposure concentration of a chemical to the chemical's reference concentration (the concentration of a chemical that is recognized as unlikely to result in adverse noncarcinogenic health effects). A hazard index of unity (or 1.0) indicates that the chemical intake estimated in the exposure assessment is equal to the reference concentration and exposure at the given concentration that would not result in adverse noncarcinogenic health effects.

Port, City, and Southern Sub-Areas

PG&E is responsible for the assessment and remediation of the Port, City, and Southern sub-areas where contamination from former PG&E property is suspected of migrating onto the Port, City, and Southern sub-areas. The assessment and remediation of these areas, if necessary, would be subject to the requirements of article 22A of the San Francisco Health Code, commonly referred to as the Maher Ordinance. This ordinance is described below under "Local Regulations." It requires a site assessment and remediation process similar to the process described above for the PG&E-owned areas. For assessment and remediation of sites addressed under article 22A, the San Francisco Department of Public Health is responsible for the review of site history, site investigation, remedial planning, and site closure documents rather than the Regional Water Quality Control Board.

Site History and Remedial Status of Project Sub-Areas and Offshore Sediment Area

The proposed project would be constructed primarily within the limits of the former 34-acre Potrero Power Plant property, which has been used for various power producing and industrial activities since the mid-1800s, including manufactured gas plant operations in the northeast portion of the site.[5] PG&E constructed the power plant around 1910 and stopped operating it in March of 2011 when the Trans Bay Cable was installed to provide electricity to San Francisco.

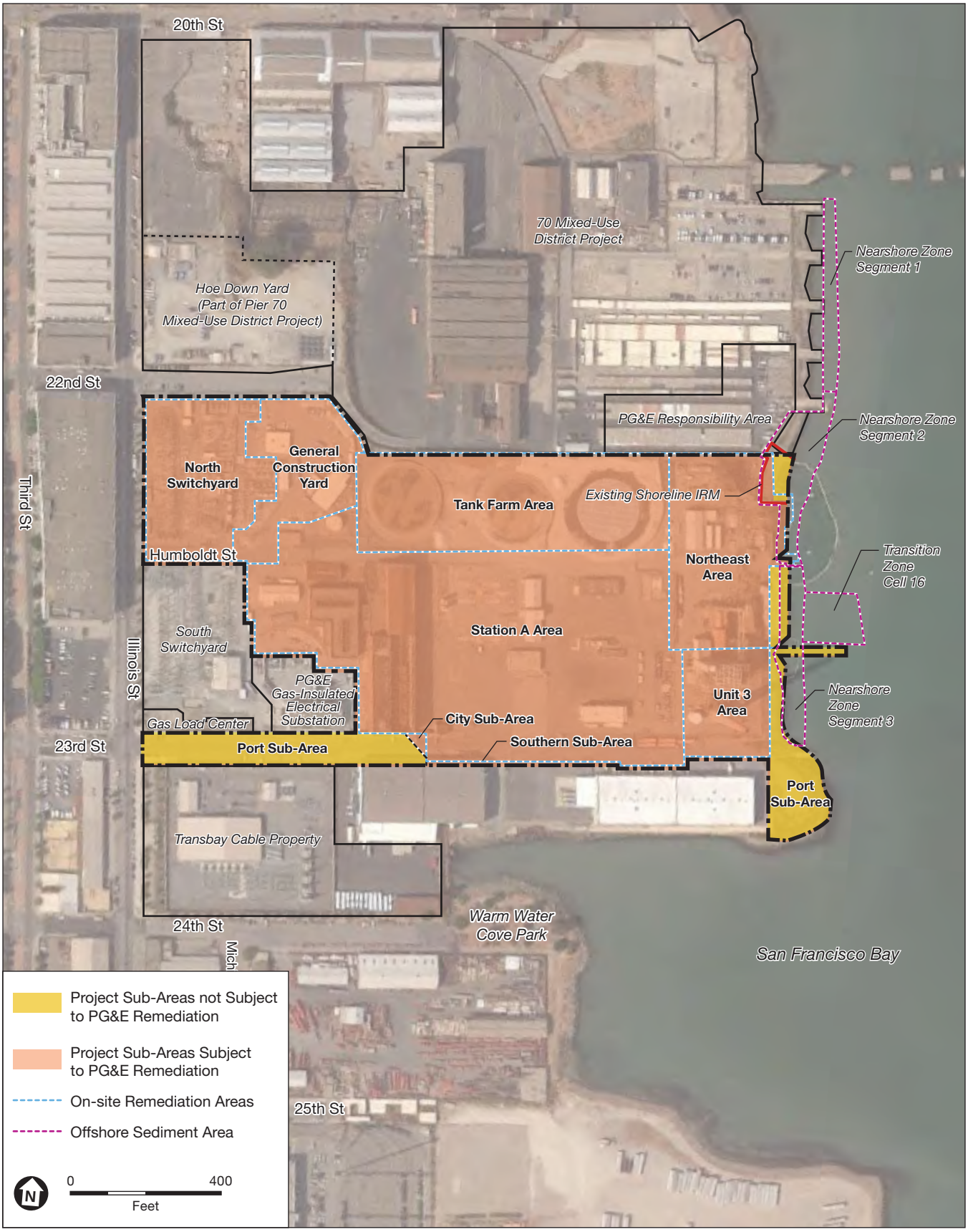
The Power Station and PG&E sub-areas are located within the former power plant boundaries while the Offshore Sediment area is adjacent to the former power plant property. The remaining portions of the original Potrero Power Plant property are not part of the project site. They are owned by PG&E and used for ongoing electricity transmission, gas loading, and dirt handling operations. These areas include the South Switchyard, Gas Load Center, Gas-Insulated Electrical Substation, and Hoe Down Yard, that are shown on **Figure 4.K-1**, **Project Site Remediation Areas and Adjacent Sites**, and are described below under "Adjacent Areas." The Port, Southern, and City sub-areas are adjacent to the former power plant property and are discussed in this sub-section.

This sub-section describes the site history and remedial status of each of the project site's sub-areas. Although they all have similar site histories, they are under different ownerships and in different stages of investigation and remediation to address contaminants in soil, groundwater, and soil vapors as summarized in **Table 4.K-1**, **Hazardous Materials Remediation Summary**. Accordingly, the Power Station and PG&E Sub-areas and the Offshore Sediment area are discussed separately, and the Port, Southern and City Sub-areas are discussed together.

Power Station Sub-Area

The Power Station sub-area is a 21-acre portion of the project site. For purposes of site remediation planning, the Power Station sub-area is further divided into the four functional areas shown on Figure 4.K-1: Station A area, the Unit 3 area, Northeast area, and Tank Farm area, all of which are described below.

[5] Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.



SOURCE: Perkins+Will 2017; Google Earth, 2017; ESA, 2018

Potrero Power Station Mixed-Use Development Project

Figure 4.K-1
Project Site Remediation Areas and Adjacent Sites

TABLE 4.K-1
HAZARDOUS MATERIALS REMEDIATION SUMMARY

Sub-Area[1]	Size	Ownership	Remediation Activities	
			Party Responsible/ Oversight	***Status as of May 2018***
Power Station Sub-Area				
Station A	12 acres	Project Sponsor	PG&E[2]/Regional board	Remediation complete for commercial and industrial land uses, including installation of durable cover. Risk management plan and operations and maintenance plan approved; land use covenant executed.
Unit 3	1.5 acres	Project Sponsor	PG&E[2]/Regional board	Subsurface investigation and human health risk assessment complete. Station A risk management plan and land use covenant being modified to include Unit 3.
Northeast	3.5 acres	Project Sponsor	PG&E[2]/Regional board	Remedial action plan approved and remediation in progress. Anticipated completion is September 2018.
Tank Farm	4 acres	Project Sponsor	PG&E[2]/Regional board	Subsurface investigation underway.
Offshore Sediment Area[3]	16 acres	CCSF/Port of SF	PG&E[1]/Regional board	Remedial action plan approved, and remediation anticipated to start in spring 2019.
PG&E Sub-Area				
North Switchyard	2.8 acres	PG&E	PG&E[2]/Regional board	Remediation complete for commercial and industrial land uses, including installation of durable cover. Site management plan and operations and maintenance plan approved; land use covenant executed.
General Construction Yard	2 acres	PG&E	PG&E[2]/Regional board	
Port Sub-Area	2.9 acres	CCSF/Port of SF	Project Sponsor/Health department	No environmental assessments have been prepared specifically for the areas of the project site adjacent to the Potrero Power Station property.
Southern Sub-Area	0.2 acre	Harrigan Weidenmuller Company	Project Sponsor/Health department	
City Sub-Area	<0.1 acre	CCSF	Project Sponsor/Health department	

NOTES: PG&E = Pacific Gas and Electric Company; Regional board = San Francisco Bay Regional Water Quality Control Board; CCSF = City and County of San Francisco; Health department = San Francisco Department of Public Health; Port of SF = Port of San Francisco

1 See Chapter 2, Figure 2-2, for location and boundaries of project sub-areas, and see Figure 4.K-1, for location of remediation areas within the sub-areas.
2 PG&E is only required to remediate soil, soil vapor, and groundwater to a commercial and industrial land use standard. The project sponsor may be required to undertake additional remediation to accommodate other land uses.
3 The Offshore Sediment area is not part of the project site, per se, but in-water construction activities under the proposed project could occur in this area.

The Power Station sub-area originally included about 22 acres. In 1999, PG&E sold this portion of the power station property to Southern Energy (the company name was changed to Mirant Potrero, LLC, then GenOn Potrero, LLC, then NRG Potrero, LLC). As a condition of the sale, PG&E retained the responsibility to characterize and remediate contamination of the soil, groundwater, and soil vapor to a level that would support commercial and industrial land uses. In 2016, PG&E purchased back 1.4 acres of Station A from NRG Potrero, LLC for building a Gas Insulated Substation (see Figure 4.K-1). California Barrel Company, LLC purchased the remaining 21 acres that comprise the Power Station sub-area from NRG Potrero, LLC in 2016.

Station A Area

Site History

The Station A area owned by the project sponsor encompasses 12 acres. The California Sugar Refinery operated in the eastern portion of the Station A area from 1883 until approximately 1950.[6] The sugar refinery contained coal sheds, a boiler room, and supporting shops (e.g., blacksmith, machine, and carpenter shops). None of these features exist today. Prior to the 1900s, the sugar refinery was powered by electricity produced by steam generators fueled by coal, then manufactured gas in the early 1900s, then fuel oil thereafter until its closure in 1950.

PG&E constructed the Station A power generation facility in the western portion of the Station A area in 1910. This facility used steam turbines to generate electric power until the late 1960s. During this time, Units 1 and 2 were located in the unreinforced masonry Turbine Building and produced electricity. From 1910 to the late 1920s, PG&E used fuel oil to fire the boilers housed in the Boiler Building. Subsequently PG&E converted to natural gas for power generation and the Boiler Building was demolished.

PG&E also constructed two gas holders west of Station A in the early 1910s, likely used for storing manufactured gas produced from manufactured gas plant operations. By 1930 these holders were no longer in use. PG&E likely used the gas holders for storage of manufactured and/or natural gas for Station A electricity generation until the 1960s. PG&E decommissioned and removed the gas holders by the late 1970s and decommissioned Station A in 1979; the buildings and electrical equipment were partially demolished in 1981. PG&E removed three diesel-powered peaker power generation units (Units 4, 5, and 6) from the Station A area in 2011.

Structures currently within the Station A area include a former gas metering house, shop, compressor building, Station A turbine building, electrical shop, an abrasive blast building, and maintenance/storage buildings. There is also a former pump station and associated piping on the southern property boundary. The Station A area is covered by structures, asphalt, or concrete pavement, which serves as a durable cover that is a component of the PG&E hazardous materials remediation for the Station A area (discussed below).

[6] Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

Remedial Status

The primary chemicals of potential concern in the soil of the Station A area include polynuclear aromatic hydrocarbons; petroleum hydrocarbons, benzene, toluene, ethylbenzene, and xylenes; metals (primarily arsenic, chromium, cobalt, and lead), cyanide, and naturally occurring asbestos.[7] The Station A area is entirely covered by structures, asphalt, or concrete pavement, which serve as a durable cover. Chemicals of potential concern in the groundwater include petroleum hydrocarbons as well as benzene, toluene, ethylbenzene, and xylenes. Soil vapors from this area contained benzene and naphthalene. Methane was not detected in the soil vapors.

PG&E conducted a human health risk assessment for the Station A area, which concluded that the chemicals present do not present a risk to current industrial users or occasional visitors such as customers, vendors, and contractors under current site conditions. The assessment found however, that risk management measures would be required to reduce health risks if the durable cover is removed/disturbed or more sensitive land uses such as residential uses are proposed. The human health risk assessment also found that risk management measures would be necessary for construction workers that may come into contact with the groundwater.

The final remedy for the Station A area includes in-place management of the soil and groundwater through maintenance of a durable cover and implementation of a land use covenant, a risk management plan, and an operations and maintenance plan. PG&E repaired the existing hardscape surfaces, and installed new hardscape where absent, on March 17, 2015.[8] The regional board approved the final remedy on May 29, 2015.

In 2016, when PG&E purchased back 1.4 acres of the Station A area for building a gas insulated substation, the Station A risk management plan was separated into two risk management plans to separately address the PG&E property and the remaining 12 acres of the Station A area that are currently owned by the project sponsor.[9] The regional board approved the revised risk management plan for the 12-acre site owned by the project sponsor (described below) on September 12, 2016 after soliciting public review and comment.[10] The requirements of this Station A area risk management plan are enforced by the regional board through the land use covenant recorded by NRG Potrero LLC on August 12, 2016 (described below).[11] On February 13, 2017, the regional board issued a no further action letter for this portion of the Station A area.[12] As of July 2018, the risk management plan for the portion of Station A owned by the project sponsor remains in effect.

---

7 Haley & Aldrich and Pivox Corporation, *Risk Management Plan, Station A NRG Area, Potrero Power Plant Site, San Francisco, California*, June 16, 2016.

8 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

9 Haley & Aldrich and Pivox Corporation, *Risk Management Plan, Station A NRG Area, Potrero Power Plant Site, San Francisco, California*, June 16, 2016.

10 San Francisco Bay Regional Water Quality Control Board, Approval of June 16, 2016 Risk Management Plan, Station A NRG Area, Potrero Power Plant, City and County of San Francisco, September 12, 2016.

11 NRG Potrero LLC, Covenant and Environmental Restriction on Property, Portion of 1201 Illinois Street, San Francisco, California, APN 4175-006 (portion), 4232-001, & 4232-006 (portion), August 12, 2016.

12 San Francisco Bay Regional Water Quality Control Board, No Further Action, Station A Area, Former Potrero Power Plant, 1201 Illinois Street, City and County of San Francisco. February 13, 2017.

Station A Risk Management Plan

The existing risk management plan for the Station A area specifies measures to be implemented when any ground disturbing construction or maintenance activities that penetrate the durable cover are conducted.[13] The requirements of the risk management plan apply to the owner of the property, including the project sponsor and any future owners, and the owner must ensure the appropriate risk management measures are conducted by any parties that penetrate the durable cover. The requirements of the Station A area risk management plan are expected to fulfill the substantive requirements of articles 22A and 22B of the health code, described below under "Local Regulations." However, any party planning ground disturbing activities at the site must obtain written concurrence of this from the San Francisco Department of Public Health prior to implementing ground disturbing activities that would trigger compliance with these articles.

Notification Requirements for Risk Management Plan Compliant Submittals

In accordance with the existing Station A risk management plan, any party proposing to conduct ground disturbing activities that would penetrate the durable cover and would result in the disturbance of 50 or more cubic yards or an area of 1,250 square feet or more must notify the regional board in writing at least 45 days prior to conducting any work, except in the case of an emergency.

For projects that involve ground disturbing activity that penetrate the durable cover but are less than 50 cubic yards in total volume of soil or an area of 1,250 square feet of durable cover disturbed, the owner must submit a Notice of Intent to Conduct Ground Disturbing Activity no less than three days prior to initiating the work.

As the administrating agency, the regional board ensures that notification packages and completion reports are routed to the San Francisco Department of Public Health for informational purposes and consideration. In addition, the owner responsible for conducting the work must provide the health department with a copy of any notifications pertaining to the discovery of unknown conditions.

The requirements of the existing risk management plan for the Station A area generally fulfill the requirements of a site mitigation report under article 22A of the health code. However, the health department may elect to review project-specific information for compliance with article 22A and may include additional requirements based on the project-specific information provided.

Notification Requirements for Risk Management Plan Variance Submittals

The project proponent may also request a variance from the Station A risk management plan requirements. If a one-time project-specific variance from the risk management plan is requested, the notice to the regional board must include all of the information required for a risk management plan compliant submittal. In addition, it must include a precise description of the request and reason for variance from the Station A risk management plan. The analysis and reasoning of how the variance is protective of human health and the environment must be stamped by a California

[13] Haley & Aldrich and PIVOX Corporation, *Risk Management Plan, Station A NRG Area, Potrero Power Plant Site, San Francisco, California*. June 16, 2016.

licensed professional engineer. Risk management plan variance requests must be submitted at least 60 days prior to performing the activity and the owner may not proceed with the project until the regional board has approved the variance.

Risk Management Measures During Construction

The Station A risk management plan specifies procedures for the management of soil and groundwater, control of dust, control of construction-related, stormwater runoff, and temporary dewatering during soil intrusive activities. Requirements for soil management address soil stockpiling, onsite reuse of soil, and offsite soil disposal. In accordance with the Station A risk management plan, soil excavated from the Station A area may be disposed of offsite or may be reused anywhere within the Power Station sub-area provided that it is placed beneath a durable cover and does not exhibit physical evidence of contamination or visible serpentinite rock. Restricted materials may not be used in utility trenches. Only clean imported soil may be used for landscaping or softscape areas where the soil would remain exposed. Following completion of any ground disturbing activities, the durable cover must be restored.

Under the Station A risk management plan, dust control measures must be implemented during construction under article 22B of the health code and the Bay Area Air Quality Management District Asbestos Airborne Toxics Control Measure, both of which are discussed in Section 4.K.2, Regulatory Framework. The Station A risk management plan requires compliance with the State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009‐0009‐DWQ (Construction General Stormwater Permit) for construction activities greater than 1-acre in size or smaller projects that are part of a larger common development plan. Groundwater produced during construction dewatering must be managed and discharged per regulatory requirements. The Construction General Stormwater Permit and regulatory requirements for discharge of groundwater are discussed in Section 4.J, Hydrology and Water Quality.

The Station A risk management plan acknowledges that unanticipated conditions such as underground storage tanks, concrete vaults, underground piping, or previously unidentified areas of contamination could be encountered during ground disturbing activities. In such an event, the risk management plan requires that work be stopped and that the property owner be notified. Appropriate regulatory agencies such as the regional board or health department must be contacted.

Risk Management Measures During Operations

Any maintenance or repair work that disturbs the durable cover must comply with the notification requirements and risk management measures for construction activities, described above.

Completion Reports

Following completion of the ground disturbing activity, or modifications to the approved remedy, the owner is required to prepare a completion report for submittal to the regional board. One of the purposes of the completion report is to document the activity as well as any corrective actions implemented, in the event that the ground disturbing activity had any unforeseen effect. The

regional board must review all completion reports to confirm that the actions taken are consistent with the Station A risk management plan procedures and protocols.

Annual Inspections and Reporting

The Station A risk management plan requires the owner to conduct annual inspections and submit an annual report and operations and maintenance checklist to the regional board by March 31 of the following year. The report must include the results of the annual inspection and self-certification of compliance with the land use covenant and risk management plan.

Should the owner discover any actions or conditions inconsistent with the Station A risk management plan at any time, including during the annual site inspection, the owner must prepare a written explanation indicating the specific inconsistencies and what efforts or measures the owner has taken or will take to correct those inconsistencies. The owner must provide the written explanation to the regional board within 15 working days of discovery.

Modifications and Variances to the Risk Management Plan

The Station A risk management plan also specifies procedures for requesting variances and for modifying the risk management plan. Reasons for modification may include, but are not limited to, addressing new regulatory requirements, changes in the understanding of environmental conditions, intrusive activity that is not addressed by the risk management plan, or redevelopment of the Station A area for more sensitive land uses, such as residential.

Changes in Land Use

Appendix B of the Station A risk management plan specifies procedures for changing land uses in the Station A area. In accordance with these procedures, a project-specific proposal must be submitted for approval to the regional board describing the proposed change in land use and evaluating the potential risks to human health and the environment, if any, posed by the proposed change in land use. If the results of the project-specific human health risk assessment indicate that a risk level will exceed a non-cancer hazard index of 1 and/or a cancer risk greater than one in a million, the project-specific proposal must include a general description of proposed measures for managing site risks. These measures must be approved by the regional board and may include engineering and institutional controls to be implemented to assure protection of current and future site users, maintenance and construction workers, and the public.

Should the risk assessment conclude that human health risks associated with the land uses under the proposed project are within acceptable standards, the regional board will issue a letter expressing conditional approval of the requested change in land use, pending submittal of acceptable engineering design documents from the project sponsor. The owner must also provide proof of acceptable implementation of the proposed measures in a completion report submitted to the regional board once the measures have been implemented. The risk management plan must be revised to reflect the changes resulting from the new land use, and the regional board must approve the revised risk management plan.

Station A Regional Board Land Use Covenant

The land use covenant on the Station A area requires implementation of the Station A risk management plan requirements. The land use covenant prohibits this area from being used for either temporary or permanent residences, motels/hotels, hospitals/health care facilities, schools for persons under 21 years of age, daycare centers for children or senior citizens, parks, playgrounds, or other recreational uses without prior approval from the regional board.[14] Additionally, groundwater may not be used for domestic purposes (e.g., drinking, cooking, or washing). Any other uses of groundwater (e.g., dust control) would need to be approved in writing by the regional board.

The land use covenant also prohibits growing vegetables, fruit, or any edible items for human consumption in the existing soil throughout the Station A area. Plants for human consumption may be grown in the Station A area if they are planted in raised beds (above the approved cover) containing clean imported soil. Fruit trees (including nut-bearing trees) may also be planted provided that they are grown in containers with a bottom that prevents the roots from penetrating into the existing soil.

Unit 3 Area

Site History

In 1883, the California Sugar Refinery (later renamed the Western Sugar Refinery) began sugar refining operations in the southeastern area of the Potrero Power Station sub-area, including the 1.5 acre Unit 3 area.[15] The sugar refinery included coal sheds, a boiler room with twenty-two boilers, a blacksmith shop, a machine shop, a carpenter and pattern shop, a refinery house, a filter house, a melting house, coke ovens and several storage sheds for raw sugar. As part of the sugar refinery operations, a wharf was constructed on the eastern side of the Unit 3 area.

Prior to the 1900s, the sugar refinery used coal as fuel for the steam generators, which produced electricity for its operations. Waste produced by the sugar refinery in the late 1800s and early 1900s may have included tars and ash from burning coal and coke. Some of the ash may have been used to fill some of the Bay mudflats underlying the raw sugar storage sheds located in the eastern portion of the Unit 3 area, although there is no available documentation of the fill activities.

The sugar refinery ceased operations in approximately 1950 and PG&E acquired the property in 1951. PG&E constructed the Unit 3 power generation facility (Unit 3) in 1965, operating it as a steam electric generation unit. The unit used fuel oil or natural gas to generate steam from the power generating turbines until 1984, when it stopped using fuel oil due to tightening emissions regulations. During that time, PG&E stored fuel oil in the Tank Farm area. PG&E shut down the Unit 3 power generation facility and retired it from service in March 2011. Structures/features previously located within the Unit 3 area include a lube oil reservoir, cooling water discharge, paint storage trailer, lube oil storage tanks, boiler, and a wash water tank. As of January 2018 structures

[14] NRG Potrero, LLC, Covenant and Environmental Restriction on Property, Portion of 1201 Illinois Street, San Francisco, California, APN 4175-006 (portion), 4232-001, & 4232-006 (portion), August 12, 2016.

[15] Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

within the Unit 3 area include the Unit 3 TurbGen Boiler (also called the Unit 3 Power Block), exhaust stack (also called the Boiler Stack or Stack), and a combined sewer pump station.

Remedial Status

Chemicals of potential concern in the Unit 3 area include polynuclear aromatic hydrocarbons, petroleum hydrocarbons, metals (arsenic and lead), and naturally occurring asbestos.[16] Residual coal tar associated with manufactured gas plant operations in the Northeast area has also been identified within fill in the southern portion of the Unit 3 area. Coal tar is a by-product of coal gas and carbureted water gasification processes and is referred to as a *dense non-aqueous phase liquid* (DNAPL) because it is heavier than water, which causes it to sink in the groundwater and accumulate on layers of low permeability soils such as clays and silts. Both continuous (mobile) and discontinuous (non-mobile) DNAPL have been identified, and the DNAPL is generally found beneath the groundwater table at the interface between the young bay mud and the overlying artificial fill materials. Groundwater from the Unit 3 area contains metals, volatile organic compounds, polynuclear aromatic hydrocarbons, and petroleum hydrocarbons; the soil vapors contain volatile organic compounds. A human health risk assessment for this area concluded that the chemicals present do not present a risk to current workers, occasional visitors, or offsite workers under current site conditions.

On September 15, 2017, the regional board approved the site investigation report and human health risk assessment for the Unit 3 area.[17] Based on similarities between this area and the Station A area, the regional board anticipates that the appropriate remedy for this area will include installation of a durable cover as well as preparation of a risk management plan and the execution of a land use covenant. The regional board recommended amending the Station A risk management plan to include the Unit 3 area, and PG&E is currently working on completing the recommended amendment. The land use covenant for the Station A area will also be extended to include this area. Once the amended risk management plan is approved, the regional board will issue a no further action letter for the Unit 3 area.

Northeast Area

Site History

The Northeast area encompasses 3.5 acres. In 1872, City Gas Company began operating the Potrero manufactured gas plant in the northern portion of the Northeast area and the Tank Farm area. The manufactured gas plant used three distinct processes to manufacture gas: coal gasification, carbureted water gasification, and oil gasification. Structures associated with the former manufactured gas plant operations included gas holders, coal sheds and bunkers, gas producers and purifiers, retorts, lampblack storage/holding pits and other facilities, and oil tanks. None of these features are present on the site today. PG&E acquired the Potrero manufactured gas plant in

[16] Haley & Aldrich, *Former Unit 3 Power Generation Facility Investigation and Human Health Risk Assessment Report, Potrero Power Plant Site, San Francisco, California*, October 7, 2016.

[17] San Francisco Bay Regional Water Quality Control Board, Approval of October 7, 2016, Former Unit 3 Power Generation Facility Investigation and Human Health Risk Assessment Report, Potrero Power Plant, City and County of San Francisco, September 15, 2017.

1906 and operated the plant until 1930 when natural gas became available for the generation of electricity. PG&E dismantled the manufactured gas plant facilities in the early 1960s.

Historical releases of coal tar, lampblack, and residuals from the former manufactured gas plant operations have affected soil and groundwater in the Northeast area. Lampblack is a black, chalky solid residue byproduct of oil gasification process. All of these materials are predominantly comprised of polynuclear aromatic hydrocarbons, chemicals which are also by-products of burning of wood, coal, and petroleum fuels.

Buildings/uses that are no longer present include the bioassay laboratory, sodium hypochlorite tank and building, sodium bisulfate area, and a maintenance building. Structures currently within the Northeast area as of January 2018 include a hazardous waste storage compound, hazardous waste collection pad, fuel truck loading pad, Butler Building (used for storage), lube oil storage building, and a former salt water intake pump system. There is also an oil/water separator in this area.

Remedial Status

The Northeast area has been affected by releases from former manufactured gas plant operations at the Potrero Power Plant. Chemicals of potential concern in the soil include polynuclear aromatic hydrocarbons, polychlorinated biphenyls (PCBs), and metals (arsenic, cadmium, and lead).[18] Coal tars still present in this area occur as continuous (mobile) and discontinuous (non-mobile) DNAPL. Where continuous DNAPL occurs, it generally accumulates in depressions on the top of the young bay mud at depths of 10 feet or more and ranges in thickness from 1 to 17 feet. In areas of discontinuous DNAPL, the coal tar occurs as isolated droplets adhering to the soil matrix, it appears as stained soil with no identifiable liquid. Discontinuous DNAPL is present at depths as shallow as 8.5 feet and extends to depths greater than 28 feet. Both continuous and discontinuous DNAPL extend onto the Pier 70 Mixed-Use District project site to the north. Groundwater within the Northeast area contains volatile organic compounds, polynuclear aromatic hydrocarbons, total petroleum hydrocarbons, metals, and cyanide. Soil vapors contain benzene, toluene, ethylbenzene, and xylenes as well as naphthalene. Methane was detected at a maximum concentration of 20.8 percent.

The Northeast area is covered by a durable cover consisting of building foundations, pavement, or hardscape. The human health risk assessment for this area concluded that there is no risk to humans under existing site conditions. However, to address the presence of benzene and naphthalene in the soil vapors in this area, measures may be required to prevent vapor intrusion if new structures for human occupancy are constructed.

[18] Haley & Aldrich, *Draft Remedial Action Plan, Northeast Area of the Potrero Power Plant Site and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California*, January, 2016.

PG&E prepared a draft remedial action plan for the Northeast area in January 2016,[19] and the regional board approved the plan in July 2016.[20] The approved remedial approach includes use of in-situ soil solidification to prevent the migration of continuous DNAPL. When PG&E completes this process, it will place durable covers over the entire remediation area to prevent human contact with the soil. PG&E will also conduct long-term groundwater monitoring to monitor the effectiveness of the remedial action. Remediation began in 2017 and is expected to be complete in 2018. When remediation of this area is complete, PG&E will prepare a risk management plan specifying measures to mitigate potential risks to the environment as well as risks to current and future on - site employees, construction and maintenance workers, visitors, and the public. PG&E will also execute a land use covenant stating that residual contamination remains, specifying acceptable land uses, and requiring implementation of the risk management measures identified in the risk management plan.

Tank Farm Area

Site History

As discussed above, City Gas Company began operating the Potrero manufactured gas plant in the northern portion of the Northeast area and in the 4-acre Tank Farm area in 1872. PG&E dismantled the manufactured gas plant in the early 1960s and constructed a tank farm in this area between 1965 and 1977. The tank farm included three large above-ground fuel tanks used to house fuel oil and a blended mixture of distillate fuels consisting of Jet A, kerosene, and diesel.[21] The tanks had a combined storage capacity of 21.7 million gallons and each had an individual secondary containment structure. PG&E delivered fuel to the tanks via aboveground pipelines that extended from an offshore terminal on the Pier 70 Mixed-Use District project site to the north. The fuel lines have been cleaned, cut, capped, and abandoned in place at the northeast property. The pipeline on the Pier 70 Mixed-Use District project site has been removed. The project sponsor removed the tanks in 2017. PG&E is currently conducting a subsurface investigation beneath the location of the former tanks.

Remedial Status

This area has been investigated by PG&E due to the former presence of the three aboveground storage tanks. In 2017, the project sponsor removed the three aboveground storage tanks from the Tank Farm area, which allowed PG&E the ability to complete its subsurface investigations in this area. PG&E has completed its investigation of the Tank Farm area and is preparing its report for submittal to the regional board in 2018. Based on the preliminary findings of the investigation, PG&E anticipates developing a remedy that consists of a durable cover, risk management plan, and implementation of the existing land use covenant for the Power Station sub-area, described below, that allows use of the property for commercial and industrial uses.

---

19 Haley & Aldrich, *Draft Remedial Action Plan – Northeast Area of the Potrero Power Plant Site and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California*, January 25, 2016.

20 California Regional Water Quality Control Board, San Francisco Bay Region, *Resolution No. R2-2016-0027, Approval of the Remedial Action Plan for: Potrero Power Plant Northeast Area and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, 1201 Illinois Street, City and County of San Francisco*, July 7, 2016.

21 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California,* August 19, 2016.

Power Station Sub-Area Private Land Use Covenants

When Southern Energy purchased the Power Station sub-area in 1999, PG&E retained the responsibility to characterize and remediate the soil, soil vapor, and groundwater to support commercial and industrial land uses. PG&E and NRG Potrero LLC (successor to Southern Energy) entered into a land use covenant in 1999 as a condition of the sale. This land use covenant prohibits the following uses of the sub-area: single family residential, low density residential, high density residential, temporary lodging, health care, school, day care, enclosed recreational space, and open space uses without the prior written consent of PG&E. NRG Potrero LLC amended the 1999 land use covenant in 2016 to accommodate the redevelopment of the Power Station sub-area to allow some of the previously-prohibited land uses while still being protective of present and future human health and safety as well as the environment.[22] The land use covenant provides specific requirements for approving the originally restricted land uses in three areas of the site, shown on **Figure 4.K-2**, **Site Planning Areas from the 2016 Land Use Covenant**. These three areas are the East Former Manufactured Gas Plant Area (inclusive of the northern portion of the Northeast remediation area, West Former Manufactured Gas Plant Area (inclusive of the entire Tank Farm remediation area), and the Remainder Area (inclusive of the Station A and Unit 3 remediation areas as well as the southern portion of the Northeast remediation area).

The requirements of the January 2016 land use covenant are referred to as the 2016 PG&E Restrictions. In September 2016, California Barrel Company, LLC recorded an additional land use covenant that requires it, as the new property owner, to comply with the restrictions and provisions of the 2016 PG&E Restrictions, and allows those restrictions to be enforced by NRG Potrero LLC in addition to PG&E.[23] This covenant did not add to, or change, any of the 2016 PG&E Restrictions.

Under the 2016 PG&E Restrictions, no single family residential uses are allowed in any portion of the Power Station sub-area,[24] and groundwater may not be used for any domestic purposes. Allowable land uses within the sub-area are as follows:

- Allowed uses in the Remainder Area include low-density residential, school, health care, daycare, high density residential, temporary lodging, enclosed recreational spaces, private open space, and shared open space.
- Allowed uses in the West Former Manufactured Gas Plant area include daycare, high density residential, temporary lodging, enclosed recreational space, private open space, and shared open space.
- Allowed uses in the East Former Manufactured Gas Plant Area include high-density residential, temporary lodging, and enclosed recreational space, provided that these uses are located above the ground floor. Shared open space is also allowed.

---

22 Pacific Gas & Electric Company, *Declaration of Covenants, Conditions, and Environmental Restrictions*, January 14, 2016.

23 California Barrel Company LLC, *Declaration of Additional Covenants, Conditions, and Environmental and Land Use Restrictions*, September 26, 2017.

24 Single family residences are considered detached single family homes. This land use is restricted because residents in single family housing may typically conduct gardening and other ground disturbing activities that would result in contact with the soil. Multifamily housing is allowed (provided that appropriate cleanup levels are met) because ground disturbing activities are not typically conducted by residents of multi-family housing, particularly where the housing is above ground level.

SOURCE: PG&E, 2016

Potrero Power Station Mixed-Use Development Project

Figure 4.K-2
Site Planning Areas from the 2016 Land Use Covenant

The 2016 PG&E Restrictions include the required conditions for implementing the above land uses in the Power Station sub-area. Thus, pursuant to these restrictions, a human health risk assessment must be completed for the land uses under the proposed project. The risk assessment must be approved by the regional board, and the site design must incorporate measures approved by the regional board for the management of site risks. Buildings for all of the proposed land uses must also implement measures to control the intrusion of methane vapors. To achieve clean closure of a site, such that no engineering controls are required to manage site risks, the risk assessment must demonstrate that risks to future site occupants under the proposed land uses would be an excess cancer risk of one in a million or less and non-cancer risks would be a hazard index of 1 or less. For soil, these criteria must be met to a depth of 4 feet.

For daycare uses to be approved, the building site must receive clean closure for soil vapors, meaning that no chemicals are present in the soil vapors at concentrations greater than approved cleanup levels. The outside areas of the day care must also be underlain by 4 feet of clean soil. For other site uses, passive or active measures to control soil vapor intrusion may be allowed if chemicals are present in the soil vapors at concentrations greater than approved cleanup levels. Shared open spaces must be covered by clean softscape or hardscape.

Once the regional board issues a no further action letter certifying that a development site within the Power Station sub-area has been remediated to a level that is protective of human health and the environment for the proposed land use, the above land use restrictions will be removed. However, single family residences and use of groundwater for domestic purposes are prohibited in all cases, in the Power Station sub-area.

Under the 2016 PG&E Restrictions, parties may conduct certain activities within the Power Station sub-area such as:

- Undertaking routine operations and installation and repair of utilities, structures, and equipment;
- Conducting environmental assessments or tests; and
- Decommissioning, dismantling, or removing any improvements in the sub-area and developing the Power Station sub-area or any portion thereof.

These activities are subject to the land use restrictions stated above.

Offshore Sediment Area

Investigations by PG&E have detected elevated polynuclear aromatic hydrocarbon concentrations in the sediments offshore from the project site in, a 16-acre area referred to as the Offshore Sediment area, shown on Figure 4.K-1, p. 4.K-5.[25] In 2009, PG&E installed a shoreline revetment on the Port-Owned shoreline located between the on-land Northeast area and the Pier 70 Mixed Use District

[25] Haley & Aldrich, *Remedial Action Plan, Offshore Sediment Area, Potrero Power Plant Site, San Francisco, California*, December 2017.

project property (see Figure 4.K-1, p. 4.K-17) as an interim remedial measure[26] to stabilize and limit erosion of the shoreline and embankment, limit direct contact with the manufactured gas plant constituents on the shoreline, and enhance the shoreline appearance. This measure included removal of debris and manufactured gas plant-related materials from the upper few feet of fill material, placement of a cap to prevent future migration of manufactured gas plant residues to the bay, and placement of stone along the shoreline to minimize erosion. PG&E prepared a remediation plan for the remainder of the Offshore Sediment area in December 2017,[27] which the regional board approved in January of 2018 after a 30-day public review period.[28]

The Offshore Sediment area is divided into three zones: the Nearshore Zone that extends approximately 50 to 70 feet from the shoreline; the Transition Zone that extends another approximately 100 to 150 feet offshore; and the Ambient Area, which is beyond the Transition Zone. The highest polynuclear aromatic hydrocarbon concentrations were identified in the Nearshore Zone. This zone is divided into three segments for remedial planning purposes, and the Power Station sub-area is adjacent to Segments 2 and 3. The overall planned remedial action in this zone includes dredging up to several feet of sediment to remove those sediments with the highest polynuclear aromatic hydrocarbon concentrations and placement of a cap to isolate the remaining sediments. Within Segment 2, the cap will also include a chemically reactive layer to prevent the migration of dissolved polynuclear aromatic hydrocarbons through the cap. PG&E's remedial action will also include replacement of the cap constructed as part of an Interim Remedial Measure in 2010. Segment 1 of the Nearshore Zone is adjacent to the Pier 70 Mixed-Use District project site to the north of the project site.

Additional remediation is planned in the Transition Zone which is divided into nine cells for remedial planning purposes. Cells 13 through 18 of the Transition Zone are located offshore of the Potrero Power Station sub-area. Of these, PG&E has determined on the basis of a risk assessment that the only cell requiring remediation is Cell 16 which is shown on Figure 4.K-1, p. 4.K-5. The planned remedial approach for this cell includes monitored natural recovery/attenuation, which relies on natural sedimentation processes to isolate and mix sediments. This process results in the accumulation of clean sediments on top of the existing sediments, thereby reducing exposure to the deeper contaminated sediments. The remaining cells of the Transition Zone are located offshore of the Pier 70 Mixed-Use District project site to the north of the project site and are not shown on Figure 4.K-1. Beyond the Transition Zone, sediments in the Ambient Zone contain ambient levels of polynuclear aromatic hydrocarbons that do not require remediation.

PG&E anticipates beginning the offshore sediment remediation in the spring of 2019 with completion by early 2020. At the completion of remedial activities, PG&E will prepare a risk management and monitoring plan specifying activities to be conducted by PG&E to monitor the effectiveness of the offshore remediation and condition of the engineered cap. The risk

[26] An interim remedial measure is one that is implemented to address an immediate risk to human health or the environment while remedial planning is still in progress to develop

[27] Haley & Aldrich, Remedial Action Plan, Offshore Sediment Area, Potrero Power Plant Site, San Francisco, California. December 2017.

[28] San Francisco Bay Regional Water Quality Control Board, Resolution No. R2-2018-0002, Approval of the Remedial Action Plan for: Potrero Power Plant Offshore Sediment Area, Pacific Gas and Electric Company, Potrero Power Plant Site, 1201 Illinois Street, City and County of San Francisco. January 4, 2018.

management and monitoring plan will also specify requirements for conducting intrusive activities that could penetrate the cap, penetrate the shoreline revetment on the Port-owned property, or would otherwise encounter contaminated sediments. The plan would also specify requirements for the handling and disposal of any sediments encountered during future subsurface activities. A land use covenant may also be recorded, which would require implementation of the risk management and monitoring plan requirements, and may impose restrictions on access and activities that could disrupt the Offshore Sediment area where residual contamination remains. The risk management and monitoring plan will be subject to review and approval by the regional board.

PG&E Sub-Area

PG&E currently owns the 4.8-acre PG&E sub-area, which consists of two functional areas: the North Switchyard and the General Construction Yard (Figure 4.K-1, p. 4.K-5). PG&E also owns the South Switchyard, Gas Load Center, and the PG&E Gas-Insulated Electrical Substation to the south. These areas are not included in the project site, and are discussed below under "Adjacent Areas."

In general, the PG&E sub-area has been used for industrial purposes since the 1880s, including barrel manufacturing, roofing products manufacturing, and gas storage for the former manufactured gas plant operation on the adjacent Potrero Power Plant property.[29] All transformers remaining on the property are either dry-type or contain non-PCB fluids. Only *de minimis* staining was observed on the pavement in the General Construction Yard, and there is no other evidence of leaks, spills, or stained gravel/soil.

In the fall of 2003, PG&E removed portions of two abandoned fuel oil lines, along with associated steam lines, electrical conduits, and support structures from the PG&E sub-area. The fuel oil lines were drained of any remaining fluid and steam cleaned. Some sections of the lines were removed and other sections were capped and abandoned in place. In 2004, PG&E constructed a static volt-ampere reactive compensation facility (used to regulate the voltage of transmitted power) on part of the North Switchyard and the General Construction Yard.

North Switchyard Site History

In the late 1800s, California Barrel Company[30] used the South Switchyard area and the Pacific Refining and Roofing Company used the North Switchyard area.[31] In the early 1900s, California Barrel Company transferred its operations to the North Switchyard and shared this area with the Western Sugar Refining Company until the late 1950s. PG&E removed the structures in the North Switchyard by 1963, and used this area for parking and storage. In 2002, PG&E expanded its switchyard operations to the North Switchyard. By 2010, the North Switchyard had been fully developed into its 2017 configuration. The North Switchyard was never used for manufactured gas

[29] Geosyntec Consultants, *Phase I Environmental Site Assessment, 1201B Illinois Street, San Francisco, California*, September 8, 2017.

[30] The historical California Barrel Company, although the namesake of the project sponsor, is unrelated to the sponsor.

[31] Haley & Aldrich and Pivox Corporation, *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August 2015.

plant operations, although a solid black carbon-rich material was observed during trenching activities at the site in 2002.

As of 2017, the switchyard (including both the North and South switchyards) serves as the point of delivery of power to the electric grid system and includes a 12 kilovolt (kV) control building, 115 kV subsurface transmission lines, a static volt-ampere reactive compensation facility, overhead transmission lines, and associated equipment such as transformers and shunt capacitors.[32] An oil catch basin, located north of Humboldt Street, provides secondary containment for switchyard equipment and a 24-inch diameter underground natural gas pipeline runs parallel to Humboldt Street. A stormwater retention pond located along the southern boundary collects stormwater runoff from the North Switchyard.

General Construction Yard Site History

From 1887 through at least 1914, the General Construction Yard included a 1,700,000-gallon aboveground reservoir tank operated by the Western Sugar Refining Company.[33] Based on annotations in the Fire Insurance Maps, the contents of the tank are presumed to have been water. The tank was later demolished. A new 10,000,000-cubic foot aboveground storage tank was constructed in its place sometime between 1946 and 1956 and remained on the eastern portion of the site until sometime in the early 1980s. This tank was used to store manufactured gas produced in the manufactured gas plant. Following its removal, PG&E constructed the existing evidence locker and gas load center structures. By 1987 the General Construction Yard had been developed into its 2017 configuration.

As of 2017, the General Construction Yard contains temporary maintenance and administration buildings (i.e., trailers), equipment containers, and a warehouse structure that is used as an evidence locker. Equipment storage containers are located along the western and northern sides of the yard on asphalt or concrete paved areas. Additionally, PG&E operates a paved vehicle maintenance area. Immediately to the south of the PG&E property, within the Power Station sub-area, there is a fire pump house with two 275 - gallon diesel aboveground storage tanks surrounded by a concrete containment system.

Remedial Status

For remedial planning purposes, the PG&E sub-area has been divided into two areas: the North Switchyard and General Construction Yard shown on Figure 4.K-1, p. 4.K-5. These areas have been investigated several times to evaluate soil and groundwater quality. Chemicals of potential concern in these areas include total petroleum hydrocarbons; polynuclear aromatic hydrocarbons; benzene, toluene, ethylbenzene, and xylenes; pesticides; and metals.[34] PCBs were not detected in soil samples from these areas. In 2002, a black carbon-rich material was identified in the fill within two utility trenches located in the North Switchyard. This material was excavated and disposed off-site

[32] Haley & Aldrich and Pivox Corporation, *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August 2015.

[33] Geosyntec Consultants, *Phase I Environmental Site Assessment, 1201B Illinois Street, San Francisco, California*, September 8, 2017.

[34] Haley & Aldrich, Inc., *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August 2015.

as a California Hazardous Waste. Elevated levels of chemical constituents have not been identified in the groundwater during previous groundwater quality investigations.

A site-specific human health risk assessment for the PG&E sub-area concluded that, based on existing industrial site land use and site conditions (i.e., presence of a durable cover), potential exposures to chemicals in soil and groundwater do not present an unacceptable human health risk for commercial workers, construction workers, or maintenance workers. However, soil intrusive work or soil excavation could result in contact with affected soil or groundwater and could result in related health effects.

Site Management Plan

PG&E prepared a site management plan[35] for the Switchyard and General Construction Yard in 2011 specifying measures to manage site risks associated with soil intrusive work. On February 17, 2012, the regional board issued a no further action letter for the PG&E property. In August 2015, PG&E revised the site management plan to provide operational and maintenance guidelines to prevent worker exposure to affected soil and groundwater during construction/maintenance activities.[36] The regional board approved this updated plan on November 23, 2015.[37]

The updated site management plan specifies procedures for the control of dust and management of soil and groundwater during ground disturbing activities. Dust control measures must be implemented in accordance with article 22B of the health code and the air district's Asbestos Airborne Toxics Control Measure, both of which are discussed in Section 4.K.2, Regulatory Framework. Requirements for soil management address soil stockpiling, onsite reuse of soil, offsite soil disposal, excavation dewatering, and site access. The updated site management plan acknowledges that unanticipated conditions such as underground storage tanks, concrete vaults, underground piping, or previously unidentified areas of contamination could be encountered during ground disturbing activities. In this event, the updated site management plan requires that work be stopped and the appropriate PG&E personnel be contacted. Appropriate regulatory agencies such as the regional board or health department must be contacted by PG&E. Modifications to the updated site management plan may be required in the event of a change in property use, change in environmental conditions, implementation of ground disturbing activities not anticipated in the updated plan, and/or new legal or regulatory requirements.

Regional Board Land Use Covenant for Switchyard and General Construction Yard

The regional board and PG&E recorded a land use covenant for the North Switchyard and General Construction Yard in January 2012.[38] The land use covenant requires compliance with the approved site management plan including maintenance of the durable cover and specific

[35] A site management plan is the equivalent of a risk management plan. Regarding hazardous materials investigations and remediations, these terms are often used interchangeably.

[36] Haley & Aldrich and Pivox Corporation. *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August 2015.

[37] San Francisco Bay Regional Water Quality Control Board, Approval of August 2015 Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant, City and County of San Francisco, November 23, 2015.

[38] PG&E, *Covenant and Environmental Deed Restriction on Property, Potrero Switchyard and General Construction Yard 1201 Illinois Street, San Francisco, California*, September 15, 2011.

requirements for any excavation work that would breach the durable cover. The land use covenant also limits future land uses on the site to commercial and industrial uses, only. Residential uses, hospitals, day cares, and schools for persons under the age of 21 are specifically prohibited. Installation of soil borings, construction of groundwater wells, and extraction of groundwater for any use is not allowed, unless approved, in writing, by the regional board.

Port, Southern, and City Sub-Areas

Site History

Environmental assessments have not been prepared for the Port, Southern, and City sub-areas. Based on a review of previous land uses on and adjacent to these sub-areas, these portions of the project site were previously occupied by several railroad tracks and underground utility lines that originated from the former Western Sugar Refining company in the early 1900s.[39] By 1950, the rail lines had been removed. In addition, the Phase I environmental site assessment for the Potrero Power Station indicates that the Port sub-area along the bay shoreline included the Potrero Manufactured Gas Plant wharf and a sugar refinery wharf between approximately 1880 and 1950.[40]

The shoreline portion of the Port sub-area is currently covered by former concrete foundational elements and rip-rap consisting of a layer of cobble-sized rock. The investigation for the Unit 3 area included assessment of surface soil along the shoreline of the Port property located immediately adjacent to the east of the Unit 3 area.[41] Based on the results for soil samples collected from the shoreline area owned by the Port, historical site activities do not appear to have adversely affected the surficial soil (0 to 2 feet bgs) along the shoreline beneath the riprap. Arsenic and benzo[a]pyrene were the only constituents identified as chemicals of potential concern; however, the soil characteristics differ from the typical fill soils throughout the investigation portions of the site and are not indicative of former manufactured gas plant or electric power plant operation impacts. Based on these findings, PG&E concluded that no further evaluation is warranted for the shoreline soils within the Port area.

The other portion of the Port sub-area within 23rd Street included crude oil tanks in approximately 1900. This area is currently occupied by 23rd Street. There are no existing buildings located in the Port, Southern, or City sub-areas. [42]

Remedial Status

To date, no environmental investigations or remedial activities are known to have been completed in the Port, Southern, and City sub-areas, with the exception of the Port property located adjacent to the Unit 3 and Northeast sub-areas.

---

39 Paul Hastings, *Potrero Power Plant: Overview of Site Conditions, Ongoing Remediation, and Planned Development*, October 13, 2017.

40 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

41 Haley & Aldrich, *Former Unit 3 Power Generation Facility Investigation and Human Health Risk Assessment Report, Potrero Power Plant Site, San Francisco, California*, October 7, 2016.

42 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

Regulatory Database Review

Power Station Sub-area

The Phase I Environmental Site Assessment for the Potrero Power Station subarea describes the regulatory database review conducted in 2016 to identify current or previous reports of hazardous materials use, storage, and/or unauthorized releases that may have affected the Power Station sub-area.[43] As summarized in that document, the site is included in numerous environmental databases. Inclusion in Environmental Data Resource's Manufactured Gas Plants database indicates former use as a manufactured gas plant. The site is also identified in the Spills, Leaks, Investigation and Cleanup database maintained by the regional board, indicating that groundwater contamination has occurred. Because the site represents a low threat to the environment and PG&E has agreed to regulatory oversight by the California Department of Toxics Substances Control, the site is also identified in the Voluntary Cleanup Program database maintained by the Department of Toxic Substance Control. However, as discussed below under "Designation of Administering Agency," oversight authority has been delegated to the regional board. Inclusion in several other regulatory databases indicates that the site previously had underground storage tanks and aboveground storage tanks.

PG&E Sub-area

The Phase I Environmental Site Assessment for the PG&E sub-area describes the regulatory database review conducted in 2017 to identify current or previous reports of hazardous materials use, storage, and/or unauthorized releases that may have affected the PG&E property.[44] As summarized in that document, the site was identified in numerous environmental databases. Because the site represents a low threat to the environment and PG&E has agreed to regulatory oversight by the Department of Toxic Substance Control, the site is identified in the Voluntary Cleanup Program database maintained by the Department of Toxic Substance Control. However, as discussed below under "Designation of Administering Agency," oversight authority has been delegated to the regional board as indicated by inclusion in the GeoTracker Cleanup Sites Data list. Inclusion in several other regulatory databases indicates that the site has previously had underground storage tanks.

The regional board case number for the entire former Potrero Power Plant property is 38S0038.

[43] Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.
[44] Ibid.

Adjacent Areas

PG&E South Switchyard and Gas Load Center

As discussed above, the South Switchyard (see Figure 4.K-1, p. 4.K-5) was used by the California Barrel Company.[45] It has been used as a PG&E switchyard since the 1960s.[46] Constructed in the 1950s, the Gas Load Center (see Figure 4.K-1, p. 4.K-5), provides infrastructure to PG&E's gas supply system and includes above and below ground high-pressure gas lines and a control structure. PG&E investigated soil and groundwater quality in both the South Switchyard and the Gas Load Center as part of its investigation of the PG&E sub-area, described above, and these areas are included in the land use covenant[47] and updated site management plan[48] for the North Switchyard and General Construction Yard.

PG&E Gas-Insulated Electrical Substation

Located immediately south and west of the Power Station sub-area, PG&E's 1.4 acre gas-insulated substation (see Figure 4.K-1, p. 4.K-5) was part of the Station A remediation area until PG&E purchased back the property in 2016. This area includes the 8,500-square-foot building that houses new 230 kV gas-insulated switchgear.[49] The switchgear building is surrounded by impermeable surfaces that are a durable cover. These surfaces include concrete or paved outdoor equipment areas as well as a combination of gravel and concrete/asphalt surfaces.

Soil, groundwater, and soil vapor quality have been affected by historical operations within PG&E's Gas-Insulated Substation Area, including power generation and sugar refining. Chemicals of potential concern in the soil in this area include polynuclear aromatic hydrocarbons; benzene, toluene, ethylbenzene, and xylenes; PCBs; metals; cyanide; and naturally occurring asbestos. In the groundwater, chemicals of concern include petroleum hydrocarbons and xylenes. Chemicals of potential concern in the soil vapor include benzene and naphthalene. The human health risk assessment for the Station A remediation area concluded that the site does not pose unacceptable health risks to current or future commercial or industrial workers because the existing durable cover prevents exposure to the soil, groundwater, and soil vapors. However, because risks could occur as a result of soil disturbing activities, PG&E prepared a site management plan identifying risk management measures to be implemented during such activities.[50] PG&E also recorded a land use covenant on the property requiring compliance with the site management plan and restricting

[45] The historical California Barrel Company, although the namesake of the project sponsor, is unrelated to the sponsor.

[46] Haley & Aldrich and Pivox Corporation, *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August, 2015.

[47] PG&E, *Covenant and Environmental Deed Restriction on Property, Potrero Switchyard and General Construction Yard 1201 Illinois Street, San Francisco, California*, September 15, 2011.

[48] Haley & Aldrich and Pivox Corporation, *Updated Site Management Plan, Switchyard, Gas Load Center, and General Construction Yard, Potrero Power Plant Site, 1201 Illinois Street, San Francisco, California*, August, 2015.

[49] Haley & Aldrich and Pivox Corporation, *Risk Management Plan, Station A PG&E Area, Potrero Power Plant Site, San Francisco, California*, June 16, 2016.

[50] Ibid.

future land uses at the site.[51] The regional board approved the plan on September 9, 2016[52] and issued a no further action letter for this area on February 13, 2017.[53]

PG&E Hoe Down Yard

The Hoe Down Yard is located north of the PG&E sub-area across 22nd Street as shown on Figure 4.K-1, p. 4.K-5. This area has been occupied since approximately 1886. It and was initially used for horse stables and support facilities for the former manufactured gas plant at the Potrero Power Plant.[54] The support facilities included 30,000 to 40,000 barrel aboveground fuel storage tanks, an oil heater house, and associated aboveground pipelines, all of which have been removed. The Hoe Down Yard is now used by PG&E as a material/soil staging area used to temporarily store drilling mud[55] and surplus clean soil from pipeline construction projects for use as trench backfill.

Soil, groundwater, and soil vapor quality have been affected by historic operations at the Hoe Down Yard. A human health risk evaluation conducted by PG&E found that there is no risk to human or ecological receptors under existing site conditions. Because risks could occur as a result of soil disturbing activities, PG&E prepared a site management plan identifying risk management measures to be implemented during soil disturbance activities. PG&E also recorded a land use covenant on the property.

The Hoe Down Yard will be redeveloped under the planned Pier 70 Mixed-Use District project.[56] As part of that project, an updated site management plan will be prepared and will include additional risk management measures for future commercial and residential uses at the Hoe Down Yard, as needed.

Pier 70 Mixed-Use District

The Port of San Francisco's 69-acre Pier 70 Mixed-Use District project property (see Figure 4.K-1, p. 4.K-5) is a former ship building facility that will be redeveloped under the Pier 70 Mixed-Use District project.[57] Soil, groundwater, and soil vapor quality have all been affected by historic ship building and industrial activities at Pier 70. Accordingly, the Port of San Francisco has prepared a risk management plan for management of health risks and has recorded a land use covenant on the property.

---

51 Pacific Gas and Electric Company, *Covenant and Environmental Restriction on Property, 1201C Illinois Street, San Francisco, California, APN 4175-006*, August 28, 2016.

52 San Francisco Bay Regional Water Quality Control Board, Approval of June 16, 2016 Risk Management Plan, Station A PG&E Area, Potrero Power Plant, City and County of San Francisco, September 9, 2016.

53 San Francisco Bay Regional Water Quality Control Board, *No Further Action, Station A Area, Former Potrero Power Plant, 1201 Illinois Street, City and County of San Francisco*, February 13, 2017.

54 Geosyntec Consultants, *Phase I Environmental Site Assessment, 1201B Illinois Street, San Francisco, California*, September 8, 2017.

55 Drilling mud is a heavy, viscous fluid mixture used in drilling operations to carry rock cuttings to the surface and also to lubricate and cool the drill bit.

56 City and County of San Francisco Planning Department, Case No, 2014-001272, State Clearinghouse No. 2015052024, Draft Environmental Impact Report, Pier 70 Mixed-Use District Project, December 21, 2016.

57 Ibid.

Former manufactured gas plant operations at the Potrero Power Plant extended onto the southern portion of the Pier 70 Mixed-Use District project, and both continuous and discontinuous DNAPL have been identified within some portions of the fill material near the existing slipways.[58] Site investigations conducted by the Port of San Francisco and PG&E identified two localized areas within the Pier 70 Mixed-Use District project area where the accumulated DNAPL is at least 1-foot thick as well as additional areas of discontinuous DNAPL.[59]

As presented in PG&E's draft remedial action plan for the Northeast area of the Potrero Power Plant, PG&E's remediation of the DNAPL area within the Pier 70 Mixed-Use District project area (referred to as the PG&E Responsibility area) will include excavating the continuous DNAPL areas at the southernmost slipway to a depth of about 23 feet and backfilling the excavations with clean fill.[60] Durable cover(s) will be installed over the excavated and backfilled areas. The durable cover(s) will consist of pavement, hardscape, or clean fill and vegetation over a demarcation layer to indicate the transition to underlying contaminated soil. With future development of the site, concrete slabs, asphalt, or new buildings may also act as a durable cover. Areas of discontinuous DNAPL will remain at the project site. The regional board approved this remedial approach in July 2016.[61]

The Port of San Francisco has prepared a risk management plan for the entire Pier 70 Mixed-Use District project area, including the discontinuous DNAPL area, which includes protocols for controlling exposure to chemicals left in place during future use of this area. PG&E began in 2018 and will continue for 18 months, to be completed prior to redevelopment of the Pier 70 Mixed-Use District project.[62]

South Trans Bay Cable Property

The 8.5-acre Trans Bay Cable Property (which includes the Trans Bay Cable-SF Converter Station) is located immediately to the south of the project site (see Figure 4.K-1, p. 4.K-5). This property includes a converter station constructed in 2010 that converts DC current from the Transbay Cable to AC current and transmits the power to the PG&E switchyard.[63] The site was previously used for the storage of fuel oil and crude oil in aboveground tanks and included up to 11 underground storage tanks; seven of the underground storage tanks were removed. In addition, a manufactured gas plant was formerly located on the east side of the property.

---

58 Haley & Aldrich, *Draft Remedial Action Plan, Northeast Area of the Potrero Power Plant Site and a Portion of the Southeast Area of Pier 70, Potrero Power Plant Site, San Francisco, California*, July 7, 2015.

59 Discontinuous DNAPL refers to DNAPL that is present as isolated droplets adhering to the soil matrix. These isolated droplets are not interconnected and there is no possibility for the DNAPL to flow.

60 Haley & Aldrich, *Draft Remedial Action Plan, Northeast Area of the Former Potrero Power Plant and a Portion of the Southeast Area of Pier 70 Feasibility Study, Potrero Power Plant Site, San Francisco, California*, January 2016.

61 California Regional Water Quality Control Board, San Francisco Bay Region. Resolution No. R2-2016-0027, Approval of the Remedial Action Plan for: Potrero Power Plant Northeast Area and A Portion of the Southeast Area of Pier 70, July 7, 2016.

62 Pacific Gas & Electric web site, Potrero Power Plant, Cleanup Areas and Recent Activities, *http://www.pge.com/en/about/environment/taking-responsibility/mgp/Potrero/cleanup-and-activities/index.page*, accessed August 26, 2018.

63 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.

Before developing the existing converter station, Trans Bay Cable removed the upper 4 feet of soil within the operations portion of the site and the upper 3 feet of soil within the landscaped area along Illinois Street. It conducted deeper excavations in the transformer secondary containment area and for utility trenches. Trans Bay Cable also placed a geotextile fabric as a demarcation between the clean fill and native soil. To prevent exposure to chemicals in soil vapors, Trans Bay Cable installed soil vapor barriers and passive venting systems beneath the onsite buildings.

Based on the results of site investigations and the soil remediation described above, the human health risk assessment for the property recommended implementing risk management measures to prevent human contact with the native soil and prohibiting the use of groundwater for any purposes.[64] The risk management prepared for the site in 2009 specifies the appropriate risk management measures. In January 2010, the facility recorded a land use covenant on the property that restrict future land and groundwater uses and require implementation of the risk management plan.[65]

Naturally Occurring Asbestos

In 1986, the California Air Resources Board (air board) identified naturally occurring asbestos, which is present in many parts of California, as a toxic air contaminant. Naturally occurring asbestos is commonly associated with serpentine and ultramafic rock types such as serpentinite of the Franciscan Complex. Serpentinite rock is apple green, brown, reddish brown, and gray to black and has a waxy or shiny appearance. The usual appearance of serpentine is fine grain and compact, but it can be flaky or fibrous. Chrysotile asbestos (a form of asbestos from the serpentine mineral group) and amphibole asbestos (including tremolite) are naturally occurring asbestos minerals that may present a human health hazard if they become airborne and are inhaled.

As discussed in the initial study under geology and soils, and as shown in Chapter 2, Project Description, on Figure 2-1, Project Location, the historic 1851 shoreline generally bisects the Power Station sub-area. Areas to the east of the historic shoreline were filled as part of land reclamation activities that began in the late 1800s and continued into the mid-1990s.[66] The majority of the fill consists of crushed Franciscan Complex bedrock intermixed with building debris, industrial waste, and a mixture of various soil types.

Soil samples from the Power Station sub-area contained chrysotile asbestos at concentrations ranging from a trace (e.g., less than 1 percent) to 30 percent of chrysotile fibers.[67] Naturally occurring asbestos was detected in several samples from the PG&E sub-area at concentrations ranging from a trace level to 3 percent.[68] Some occurrences of serpentine and ultramafic rock are also known to have potentially elevated concentrations of naturally occurring metals such as arsenic, cobalt, copper, chromium (including hexavalent chromium), and nickel.

64 URS, *Long-Term Risk Management Plan/Soil Management Plan, Trans Bay Cable Converter Station Site at 435, 25, and 555 Twenty -Third Street, San Francisco, California*, November, 2009.
65 Chicago Title Company, *Covenant and Environmental Restriction on Property*, January 8, 2010.
66 Engeo, Incorporated, *Preliminary Geotechnical Report, Potrero Power Plant, San Francisco, California*, September 7, 2017; revised September 14, 2017.
67 Geosyntec Consultants, *Phase I Environmental Site Assessment, Former Potrero Power Plant, San Francisco, California*, August 19, 2016.
68 Ibid.

Hazardous Building Materials

As discussed in Chapter 2, Project Description, under the proposed land use program, the project would demolish approximately 20 buildings and structures on the project site. All of these buildings were constructed as part of the historic power generating and industrial activities at the project site. Based on their age, hazardous building materials may have been used in their construction. These potential hazardous building materials include asbestos-containing materials; PCBs in building materials and electrical equipment such as fluorescent light ballasts; fluorescent light ballasts that contain di (2 ethylhexyl) phthalate (DEHP); fluorescent lights containing mercury; and lead-based paints.

4.K.3 Regulatory Framework

Hazardous materials and hazardous wastes are subject to extensive federal, state, and local regulations, with the major objective of protecting public health and the environment. In general, these regulations define hazardous materials; establish reporting requirements; set guidelines for handling, storage, transport, remediation, and disposal of hazardous wastes; and require health and safety provisions for workers and the public. The major federal, state, and regional agencies enforcing these regulations include the U.S. Environmental Protection Agency (U.S. EPA), Occupational Safety and Health Administration, and the U.S. Department of Transportation at the federal level; the Department of Toxic Substance Control, state board, and regional board at the state level; and the air district at the regional level. Various agencies and departments of the City and County of San Francisco implement and enforce these requirements as well as specific requirements of the City and County of San Francisco, as discussed below.

Federal Regulations

State and local agencies often have either parallel or more stringent rules than federal agencies. In most cases, to the extent that state law is more stringent than federal law, state law prevails over federal law and enforcement of these laws is typically the responsibility of the state or of a local agency to which enforcement powers are delegated.

National Contingency Plan

Title 40 of the Federal Code of Regulations, section 300.430 (the National Contingency Plan), addresses selection of a remedy at sites where actions may be necessary to control site risks. For known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess lifetime cancer risk to an individual of between one in ten thousand and one in a million. For non-cancer effects, the National Contingency Plan states that an acceptable exposure level should be defined. According to U.S. EPA guidance, generally if the Hazard Index is greater than 1 there may be a concern for potential non-cancer effects.[69] Therefore, in calculating remediation

[69] United States Environmental Protection Agency (U.S. EPA), *Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals, Interim*), December, 1981.

goals at a site to protect for non-cancer effects, remediation goals are generally set at a Hazard Index at or below 1.

State Regulations

Designation of Administering Agency

The California Health and Safety Code section 25262 allows parties responsible for site cleanup to request designation of a single state or local agency to oversee the cleanup action. On April 17, 2001, the San Francisco Bay Regional Water Quality Control Board was designated the administering agency for the Potrero Power Plant remediation site pursuant to this regulation.

Hazardous Waste Classification Criteria

Under Title 22 of the California Code of Regulations section 66261.20, et seq., excavated soil is classified as a hazardous waste for offsite disposal purposes if it exhibits the characteristics of ignitability, corrosivity, reactivity, or toxicity. A waste is considered toxic under Title 22 of the California Code of Regulations, division 4.5, article 3, section 66261.24 if it contains certain substances at concentrations that meet any of the following thresholds:

- total concentrations of certain substances at concentrations greater than the state total threshold limit concentration,
- soluble concentrations greater than the state soluble threshold limit,
- soluble concentrations of certain substances greater than federal toxicity regulatory levels using a test method called the Toxicity Characteristic Leaching Procedure or
- specified carcinogenic substances at a single or combined concentration of 0.001 percent or more.

Under section 66261.24, a waste is considered hazardous under state and federal regulations if the soluble concentration exceeds the Toxicity Characteristic Leaching Procedure level as determined by the Toxicity Characteristic Leaching Procedure method. Because the Toxicity Characteristic Leaching Procedure involves a 20-to-1 dilution of the sample, the total concentration of a substance in the soil would need to exceed 20 times the regulatory level for the soluble concentration to exceed the regulatory level in the extract. A waste would also be considered hazardous under state regulations if the soluble concentration of a substance exceeds the soluble threshold limit determined by a waste extraction test, which involves a 10-to-1 dilution of the sample. Because of this, the total concentration of a substance would need to exceed 10 times the soluble threshold limit for the soluble concentration to possibly exceed the soluble threshold limit in the extract. A waste also may be classified as toxic if testing indicates toxicity greater than specified criteria.

Asbestos-Containing Materials

Asbestos wastes transported offsite are considered a hazardous waste in accordance with Title 22 of the California Code of Regulations, division 4.5, article 3 section 66261.24, if the asbestos is friable and the asbestos content is 1 percent or greater.

Lead-Based Paint

Demolition debris that is painted with lead-based paint that is intact may or may not be considered hazardous waste. In order for the entire item to be hazardous, the lead concentration in the paint and the painted item (i.e., door, beam, etc.) must exceed the total threshold limit of 1,000 milligrams per kilogram (mg/kg) of lead, soluble threshold limit of 5 milligrams per liter (mg/L), or Toxicity Characteristic Leaching Procedure level of 5 mg/L in accordance with Title 22 of the California Code of Regulations, division 4.5, article 3, section 66261.24. In most cases, the lead concentration from the intact paint alone would not exceed hazardous lead levels for both the item and the intact paint; therefore, most materials with intact lead-based paint can be disposed of through normal practices at a regularly licensed waste facility. If the paint has been separated from the building material (e.g., chemically or physically removed), then the paint waste should be evaluated independently from the building material to determine if it is hazardous and to identify the proper management practice.

Polychlorinated Biphenyls

In California, PCB wastes are regulated as hazardous waste under Title 22 of the California Code of Regulations, division 4.5, chapter 11, section 66261.24, if the PCB concentration exceeds total threshold limit concentration of 50 mg/kg or the soluble concentration exceeds the soluble threshold limit concentration of 5 mg/L.

Asbestos Abatement in Buildings

Section 19827.5 of the California Health and Safety Code requires that local agencies not issue demolition or alteration permits until an applicant has demonstrated compliance with notification requirements under applicable federal regulations regarding hazardous air pollutants, including asbestos. The Bay Area Air Quality Management District is vested by the California legislature with authority to regulate airborne pollutants, including asbestos, through both inspection and law enforcement, and implements the California regulatory requirements through Regulation 11, Rule 2 (Asbestos Demolition, Renovation, and Manufacturing). Pursuant to California law, the San Francisco Department of Building Inspection (building department) will not issue a permit for demolition or renovation of a building until the applicant has complied with the following notice and abatement requirements.

In accordance with Regulation 11, Rule 2, the air district must be notified 10 days in advance of proposed demolition or abatement work that would involve removal of asbestos-containing materials. Notification includes the following:

- The names, addresses, and telephone numbers of both the owner(s) of the structure and the operator of the demolition or renovation;
- A description of the structure to be renovated, including location, size, number of floors, age of the oldest portion, and the present and prior use;
- The approximate amount of friable asbestos that would be removed;

- The name, address, and telephone number of the person who completed the asbestos survey, including the California Division of Occupational Safety and Health (CalOSHA) certification number;
- The procedures used, including the laboratory method, to locate asbestos-containing materials;
- The scheduled starting and completion dates of demolition or renovation;
- A description of the planned demolition or renovation and the methods to be used;
- A description of work practices and engineering control to be used, including emission control procedures for asbestos removal and waste handling;
- The name, address, and location of the waste disposal site to be used;
- Certification that at least one trained person will supervise the asbestos removal described in the plan;
- Procedures to be followed in the event that unexpected friable asbestos is encountered; and
- The name, address, and telephone number of the waste transporter.

Regulation 11, Rule 2 requires a survey of any building planned for demolition to identify asbestos-containing materials that may be present. If asbestos-containing materials are identified, they must be removed before demolition or alteration activities. During renovation, regulated asbestos-containing materials also must be removed prior to any operations that would cover the asbestos materials, making them inaccessible. During removal activities, the contractor must implement controls to ensure that there are no visible asbestos emissions to the outside air. The contractor can use methods such as wetting exposed asbestos-containing materials or providing exhaust controls to prevent asbestos emissions to the outside air. The structure being abated must also be isolated by containment barriers during removal operations, and a negative air pressure must be maintained within the containment barrier. The air district periodically inspects asbestos removal operations and will typically inspect removal operations when a complaint is received.

The local office of CalOSHA must be notified of work involving 100 square feet or more of asbestos-containing material work. The work must be conducted in accordance with the requirements Title 8 of the California Code of Regulations, division 1, chapter 3.2, subchapter 2, sections 341.6 through 341.14, and the asbestos requirements of the General Construction Safety Orders specified in Title 8 of the California Code of Regulations, chapter 4, subchapter 4, article 4, section 1529. To ensure adequate compliance with these regulatory requirements, asbestos removal contractors must be certified as such by the Contractors State License Board of California.

Lead in Construction Standard

CalOSHA's Lead in Construction Standard (contained in Title 8 of the California Code of Regulations, division 1, chapter 4, subchapter 4, article 4, section 1532.1) addresses the demolition, removal, cleanup, transportation, storage, and disposal of lead-containing material. The regulations outline the permissible exposure limit, protective measures, monitoring requirements, and compliance standards to ensure the safety of construction workers exposed to lead-based materials. CalOSHA's Lead in Construction Standard requires project proponents to develop and

implement a lead compliance plan when lead-based paint would be disturbed during construction. The plan must describe activities that could emit lead, methods for complying with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. CalOSHA requires 24-hour notification if more than 100 square feet of lead-based paint would be disturbed.

Cleanup of PCBs

The regional board has established a residential Environmental Screening Level of 0.25 mg/kg for PCBs in soil.[70] The commercial and industrial Environmental Screening Level for PCBs is 1.0 mg/kg.

Disposal of Fluorescent Light Ballasts

Most fluorescent light ballasts manufactured before 1978 contain PCBs in their capacitor and potting material. Ballasts manufactured after January 1, 1978, do not contain PCBs and should be labeled as such on the ballast. California requirements for management of fluorescent light ballasts containing PCBs are specified in Title 22 of the California Code of Regulations, division 4.5, chapter 42, section 67426.1 et seq. Under these regulations, generators who transport no more than two 55-gallon drums of PCB-containing ballasts per transportation vehicle are exempt from California regulatory requirements for generators of hazardous waste. The transporter of the ballasts must meet certain regulatory requirements, depending on the number of ballasts transported in one load. In accordance with Title 40 of the Code of Federal Regulations, section 761.60, fluorescent light ballasts with PCBs in their potting material must be disposed of in an approved landfill or decontaminated.

Between 1979 and the early 1990s, DEHP was used in place of PCB as a dielectric fluid in some fluorescent light ballasts and other electrical equipment.[71] DEHP is classified as a probable human carcinogen by the U.S. Department of Health and Human Services[72] and as a hazardous substance by the U.S. EPA in accordance with Title 40 of the Code of Federal Regulations, chapter I, subchapter I, part 261, subpart D, section 261.33. Because of this, ballasts containing DEHP must be legally disposed of or recycled and are commonly handled in the same manner as PCB ballasts.

Disposal of Mercury Containing Equipment

Spent fluorescent lamps and tubes commonly contain mercury vapors. These, and electrical switches that contain mercury, are considered a hazardous waste in California under Title 22 of the California Code of Regulations, division 4.5, chapter 11, section 66261.50. Because they are considered a hazardous waste, all fluorescent lamps and mercury-containing switches must be recycled or taken to a universal waste handler.

---

70 California Regional Water Quality Control Board, San Francisco Bay Region, *Update to Environmental Screening Levels. Interim Final*, February, 2016.

71 Green Lights Recycling, Inc., *Ballasts, http://www.glrnow.com/#front-page-4*, accessed January 24, 2018.

72 U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, *Substances Listed in the Thirteenth Report on Carcinogens*, 2014, *https://ntp.niehs.nih.gov/ntp/roc/content/listed_substances_508.pdf*, accessed January 24, 2018.

Naturally Occurring Asbestos

Asbestos-containing material is defined in Title 17 of the California Code of Regulations, section 93105(h)(9) as any material that has an asbestos content of 0.25 percent or greater. In 2001, the California Air Resources Board adopted the Asbestos Airborne Toxics Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations in areas of serpentine and other ultramafic rocks (contained in Title 17 of the California Code of Regulations, section 93105), which became effective in July 2002. The Airborne Toxics Control Measure protects public health and the environment by requiring the use of best available dust mitigation measures to prevent the offsite migration of asbestos-containing dust from road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas of ultramafic rock, serpentine, or naturally occurring asbestos. The Bay Area Air Quality Management District implements the regulation.

For construction activities that would disturb more than 1 acre of land where asbestos-containing materials are present, construction contractors must prepare an asbestos dust mitigation plan specifying measures that will be taken to ensure that no visible dust crosses the property boundary during construction. The asbestos dust mitigation plan must be submitted to and approved by the air district before construction starts, and the site operator must ensure the implementation of all specified dust mitigation measures throughout the construction project. In addition, the air district may require air monitoring for offsite migration of asbestos dust during construction activities and may change the plan on the basis of the air monitoring results. The air district may exempt a project from the requirements of the Asbestos Airborne Toxics Control Measure if a geologic evaluation by a professional geologist determines that no serpentine or ultramafic rock is likely to be found in the area to be disturbed. A construction contractor engaged in construction activities involving materials containing naturally occurring asbestos is also be required to comply with the work practices and personnel exposure monitoring requirements specified in Title 8 of the California Code of Regulations, section 1529.

Methane Control

Title 27 of the California Code of Regulations includes requirements for the control of methane from waste disposal units. Under section 20921, Gas Monitoring and Control, to provide for the protection of public health and the environment, the disposal site operator must ensure that landfill gas generated at a disposal site is controlled so that the concentration of methane gas does not exceed 1.25 percent by volume in air within any portion of any onsite structures. The project site is not a landfill; however, this criterion is used by San Francisco Department of Public Health to determine if additional monitoring of methane concentrations or implementation of gas migration controls is required.[73]

[73] California Regional Water Quality Control Board, Letter to Mr. Scott Nakamura, City and County of San Francisco Department of Public Health, *Subject: Clarification of the AB2061 Process, Clarification of the California Integrated Waste Management Board (CIWMB) Letter Dated April 4, 2001, and Development of a Protocol for Management of Methane, Mission Bay Project Area, City and County of San Francisco*, May 15, 2001.

Hazardous Waste Tracking and Transportation

Title 40 of the Code of Federal Regulations, section 260.10, defines the generator of hazardous waste as the person or entity whose action produces a waste or causes a hazardous waste to become subject to regulation. Generators of hazardous wastes are subject to the regulatory requirements of the California Department of Toxic Substances Control. In accordance with Title 22 of the California Code of Regulations, division 4.5, chapter 12, the generator of hazardous waste must have a hazardous waste generator number assigned by and registered with the State of California Department of Toxic Substances Control.

Regulatory requirements for the transport of hazardous wastes in California are specified in Title 22 of the California Code of Regulations, division 4.5, chapters 13 and 29. Under these regulations, all hazardous waste transporters must have identification numbers. These transporters must also comply with the California Vehicle Code, California Highway Patrol regulations (contained in Title 13 of the California Code of Regulations); the California State Fire Marshal regulations (contained in Title 19 of the California Code of Regulations); U.S. Department of Transportation regulations (Title 49 of the Code of Federal Regulations); and U.S. EPA regulations (contained in Title 40 of the Code of Federal Regulations).

A hazardous waste manifest is required for transport of hazardous wastes. The hazardous waste manifest documents the legal transport and disposal of the waste and is signed by the generator and transporter(s) of the waste as well as the disposal facility. California regulations require specific cleanup actions that must be taken by a hazardous waste transporter in the event of a discharge or spill, and for the safe packaging and transport of hazardous wastes.

Transport, Use, and Storage of Explosive Materials

The transport, use, and storage of explosive materials is regulated under the General Industry Safety Orders contained in Title 8 of the California Code of Regulations, division 1, chapter 4, subchapter 7, group 18 (Explosives and Pyrotechnics). In accordance with these regulations, any contractor providing blasting services must be licensed by CalOSHA, and the blaster must be physically present on site when blasting operations are performed. Explosive materials must be stored in an appropriate magazine[74] until they are used, and some materials must be stored in their shipping containers until used. All magazines must be located or protected as to minimize damage from vehicles or falling objects, and a 50-foot buffer around the magazine must be kept clear of brush, dried grass, leaves, and other combustible materials. The ground around the magazines must be sloped away from the magazine or drainage must be protected to protect the magazine from flooding. No smoking, open flames or other sources of ignition within 50 feet of any area where explosive materials are being handled, except devices necessary to ignite the fuses of set charges. The transfer of explosive materials must also be arranged so that no undue delay will occur between the time the explosive materials leave the magazine and the time they are used.

[74] A magazine is a structure specifically designed for the safe storage of explosive materials.

Local Regulations

San Francisco Health Code – Hazardous Materials and Hazardous Wastes

The City and County of San Francisco has enacted local ordinances and regulations to address the potential of encountering hazardous materials in the soil, groundwater, soil vapors, and hazardous building materials, and to ensure the safe handling of hazardous materials and hazardous and medical wastes. The following sections of the health code are implemented by the San Francisco Department of Public Health as the Hazardous Materials Unified Program Agency, and are briefly summarized below. These regulations would apply to the proposed project to address the use of hazardous materials and the potential to encounter hazardous materials in the soil:

- Article 21 (Hazardous Materials) provides for safe handling of hazardous materials in San Francisco. It requires any person or business that handles, sells, stores, or otherwise uses specified quantities of hazardous materials to keep a current certificate of registration and to implement a hazardous materials business plan. Threshold quantities are 500 pounds for solids, 55 gallons for liquids, and 200 cubic feet for compressed gases. Every business that must implement a hazardous materials business plan must also obtain a certificate of registration certifying that the hazardous materials business plan meets the requirements of Article 21. This article also specifies requirements for the installation and operation of underground storage tanks, reporting of unauthorized releases, and closure of permitted facilities (including underground storage tanks). The closure of any underground storage tank must also be conducted in accordance with a permit from the San Francisco Fire Department.

- Article 22 (Hazardous Waste Management) provides for safe handling of hazardous wastes in San Francisco. It authorizes the health department to implement the state hazardous waste regulations, including authority to conduct inspections and document compliance.

- Article 22A (Analyzing the Soils for Hazardous Waste, known as the Maher Ordinance and updated in 2013) applies to projects that involve disturbance of more than 50 cubic yards of soil, if they are located bayward of the historic high tide line, have been zoned or used for industrial purposes, are located within 150 feet of an elevated highway, have soil or groundwater contamination, or are within 100 feet of a known or suspected underground storage tank. In accordance with this article, covered projects must prepare a site history report to identify whether past site uses may have caused contamination, conduct soil and/or groundwater testing for the presence of the potentially hazardous constituents (including methane), prepare a soils analysis report, and prepare a site mitigation plan (if contamination is identified).

  If hazardous materials remain in the soil or groundwater, approval of the site mitigation plan by the health department, would be required. The site mitigation plan would include many of the same elements as the risk management plans that already exist for the project site. A land use covenant may also be required, similar to those that already exist for the project site. Upon completion of site mitigation, the site owner must submit certification that the project has received certification or verification from the appropriate state or federal agency that mitigation is complete, before health department can issue a letter of no further action.

- Article 22B (Construction Dust Control Requirements) and San Francisco Building Code section 106.A.3.2.6 collectively constitute the Construction Dust Control Ordinance which was adopted in July 2008. The ordinance applies to all site preparation work, demolition, or other

construction activities within San Francisco that have the potential to create dust. Projects that expose or disturb more than 10 cubic yards or 500 square feet of soil must comply with specified dust control measures whether or not the activity requires a permit from the building department. For projects over 0.5 acre, the Dust Control Ordinance requires that the project sponsor submit a dust control plan for approval by health department prior to issuance of a building permit by the building department. Building permits will not be issued without written notification from the Director of Public Health that the applicant has a site-specific dust control plan, unless the director waives the requirement.

The Construction Dust Control Ordinance requires project sponsors and contractors responsible for construction activities to control construction dust on the site or to implement other practices that result in equivalent dust control. Dust suppression activities may include sufficient watering of all active construction areas to prevent dust from becoming airborne; increased watering frequency may be necessary whenever wind speeds exceed 15 miles per hour. Reclaimed water must be used if required by article 21, section 1100 et seq. of the San Francisco Public Works Code.

- Article 25 (Medical Waste Generator Registration, Permitting, Inspection and Fees) requires facilities that generate medical waste to store, treat, and dispose of that waste in a manner that complies with the California Medical Waste Management Act. Small and large quantity generators of medical waste that use onsite steam sterilization, incineration, or microwave technology to treat the waste must obtain a permit from the health department, file a medical waste management plan, and maintain individual treatment and tracking records. The generator must also have an emergency action plan. The health department is required to conduct compliance inspections of small quantity generators once every two years and large quantity generators once per year. Article 25 also specifies requirements for containment, storage, treatment, and transportation of medical waste.

  If a small quantity generator is not required to register with the health department pursuant to article 25, the generator must complete an information document stating how medical wastes are stored, treated, and disposed of. The generator must also keep records of any medical waste transported offsite for treatment and disposal. These records must be maintained at the office of the small quantity generator.

San Francisco Existing Building Code – Work Practices for Lead-Based Paint

Work that could result in disturbance of lead-based paint must comply with section 327 of the San Francisco Existing Building Code, Work Practices for Lead-Based Paint on Pre-1979 Buildings and Steel Structures. Section 327 applies to the exterior of all buildings or steel structures on which original construction was completed prior to 1979 (which are assumed to have lead-based paint on their surfaces, unless demonstrated otherwise through sampling and laboratory analysis), and to the interior of residential buildings, hotels, and childcare centers. The ordinance contains performance standards, including requirements for restricting access during abatement activities; establishing containment barriers that are at least as effective at protecting human health and the environment as those in the U.S. Department of Housing and Urban Development Guidelines (the most recent Guidelines for Evaluation and Control of Lead-Based Paint Hazards); protecting the ground from contamination during exterior work; protecting floors and other horizontal surfaces from work debris during interior work; preventing migration of lead paint beyond containment barriers during the course of the work; and achieving clean-up standards. The clean-up standards

require the removal of visible work debris, including the use of a HEPA vacuum following interior work. Section 3426 prohibits these work practices for the removal of lead-based paint: (1) open flame burning or torching; (2) heat guns without containment and barrier systems, or operating above 1,100 degrees Fahrenheit (611.1 degrees Celsius) or causing the charring of paint; (3) hydroblasting or high-pressure washing without containment and barrier systems; and (4) dry manual sanding or scraping, or machine sanding or grinding, or abrasive blasting or sandblasting without containment and barrier systems or a HEPA vacuum local exhaust tool.

Section 327 also includes notification requirements. Prior to the commencement of work, the responsible party must provide written notice to the building department of the address and location of the project; the scope of work, including specific location within the site; methods and tools to be used; the approximate age of the structure; anticipated job start and completion dates for the work; whether the building is residential or nonresidential, owner-occupied or rental property; the dates by which the responsible party has fulfilled or will fulfill any tenant or adjacent property notification requirements; and the name, address, telephone number, and pager number of the party who will perform the work. Section 327 contains provisions regarding inspection and sampling for compliance by the building department, as well as enforcement, and describes penalties for non-compliance with the requirements of the ordinance.

San Francisco Public Works Code - Blasting

In addition to the applicable requirements of Title 8 of the California Code of Regulations (described above under "State Regulations"), article 15, section 776 of the San Francisco Public Works Code requires a permit from San Francisco Department of Public Works for the use of explosives. Section 779 also requires that the explosives are only used during the hours specified in the permit, and that the explosives used must be approved by the department of public works. Use of a protective mat (blasting mat) to cover explosive areas may also be required.

Emergency Response Plan

The City's Emergency Response Plan addresses the roles and responsibilities of city agencies during hazards-related emergency responses, in particular their interaction with regional, state, and federal entities.[75] Integral to this plan, the Transportation Annex describes the procedures for assessment, identification of temporary alternative solutions, and restoration of damage to transportation systems, facilities, and infrastructure due to an emergency incident. To provide flexibility for incident response to select appropriate routing, the plan does not specify designated emergency response or evacuation routes.

[75] City and County of San Francisco Emergency Management Program, *City and County of San Francisco Emergency Response Plan*, December 2010, *http://www.sfdem.org/Modules/ShowDocument.aspx?=1154*, accessed January 24, 2018.

San Francisco General Plan

San Francisco General Plan

The Community Safety Element of the San Francisco General Plan includes:

- **Objective 1:** Reduce structural and non-structural hazards to life safety and minimize property damage resulting from future disasters.

  ***Policy 1.23*:** Enforce state and local codes that regulate the use, storage, and transportation of hazardous materials in order to prevent, contain, and effectively respond to accidental releases.

  ***Policy 1.24*:** Educate public about hazardous materials procedures including transport, storage, and disposal.

  ***Policy 1.26*:** Monitor emerging industries like bioscience, and ensure that state and local codes manage risks effectively.

- **Objective 3:** Establish strategies to address the immediate effects of a disaster.

  ***Policy 3.1*:** After an emergency, follow the mandates of the Emergency Response Plan and Citywide Earthquake Response Plan.

  ***Policy 3.12*:** Address hazardous material and other spills by requiring appropriate cleanup by property owners per local, state, and federal environmental laws.

4.K.4 Impacts and Mitigation Measures

Significance Criteria

The criteria for determining the significance of impacts in this analysis are consistent with the environmental checklist in Appendix G of the CEQA Guidelines, which has been modified by the San Francisco Planning Department. For the purpose of this analysis, the following applicable criteria were used to determine whether implementing the proposed project would result in a significant impact on hazards and hazardous materials. Implementation of the proposed project would have a significant effect on hazards and hazardous materials if the project would:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;

- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Approach to Analysis

Criteria Not Analyzed

The following criteria are not analyzed in this section for the reasons described below:

- ***Safety hazards in the vicinity of a public airport or private airstrip.*** The nearest airports to the project area are San Francisco International Airport approximately 8 miles to the south and Oakland International Airport over 7.5 miles to the southeast. The proposed buildings would be a maximum of 300 feet high and would not interfere with air traffic. Therefore, there is no impact related safety hazards from location within an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private air strip.

Project Features

Both construction and operation of the project would involve the use of hazardous materials, which without appropriate controls, could create a significant hazard to the public or the environment. In general, commercial and industrial uses involve the use of greater amounts of hazardous materials. Therefore, the proposed project would result in the greatest use of hazardous materials if more flex blocks were developed for commercial and industrial uses than residential uses.

Several project-related construction activities have the potential to expose hazardous materials that are present in the soil and groundwater as well as naturally occurring asbestos in the soil based on their location, depth of excavation, and area of ground disturbance within the project site. These activities include proposed building demolitions; grading and excavation; controlled rock fragmentation for the construction of basements; construction of street improvements; and installation of new utilities for potable water, recycled water, fire protection water, wastewater, stormwater, electricity, and natural gas. In addition, there may be hazardous building materials in buildings proposed for demolition or reuse. While some flex blocks could be used for either residential or commercial purposes, both types of land uses would involve the same amount of building demolition and substantially the same amount of soil excavation. Therefore, the impacts would be substantially the same for the proposed project, maximum residential scenario, or maximum commercial scenario.

During project operations, new residential, commercial, recreational, and day care uses, could also result in exposure of future site users to hazardous materials in soil and soil vapors unless appropriate controls are implemented. In general, residential occupants of a site are considered more exposed to chemical risks than commercial occupants. This is because commercial or industrial users of a site generally occupy a site only during work hours while residential users may occupy the site for longer periods of time and consequently be exposed to the same hazardous materials for a longer period of time. In addition, residential users often include children who are more sensitive to chemical effects than adults. Further, PG&E will remediate the Power Station and PG&E sub-areas to cleanup standards for commercial and industrial land uses prior to construction of the proposed project. Therefore, the proposed project would result in a greater risk to human health if more flex blocks were developed for residential rather than commercial or industrial uses.

Methodology for Analysis of Construction Impacts

The analysis of construction-related impacts identifies hazardous materials that may be used during construction and the potential that people or the environment may be exposed to those materials during construction. Project construction could result in exposure to hazardous materials in the soil and groundwater (including via soil vapor) during excavation activities, and a release of hazardous building materials could occur during building demolition or renovation.

With respect to the use, transport, or disposal of hazardous materials, these activities would be of limited duration during construction, and hazardous materials would not be used on a long-term or routine basis during the construction period. This analysis assumes that the proposed project would comply with applicable regulations for the use of hazardous materials during construction, including the Construction General Stormwater Permit and regulatory requirements for the use of explosives. The impact analysis also assumes that the management of hazardous building materials during building demolition and renovation would be conducted in accordance with air district Rule 11, Regulation 2; San Francisco Existing Building Code, section 327; the CalOSHA Lead in Construction Standard; and disposal requirements for universal wastes. The analysis evaluates whether compliance with these regulations would ensure that impacts related to the use of hazardous materials during construction would be less than significant.

With respect to exposure to hazardous materials in the soil and groundwater, the impact analysis assumes that all construction activities would comply with the following regulatory requirements: applicable risk management plans approved by the regional board and/or the health department; local regulations, including articles 22A and 22B of the health code; the air district Asbestos Airborne Toxic Control Measure; the state board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ (Construction General Stormwater Permit); and article 4.1 of the San Francisco Public Works Code, Part 146. The analysis evaluates whether compliance with these requirements would ensure that impacts related to exposure to hazardous materials in the soil and groundwater during construction would be less than significant.

Methodology for Analysis of Operational Impacts

Operational effects of the proposed project would primarily be related to the use of hazardous materials for routine maintenance and additional hazardous materials use for life science and R&D purposes; the potential to encounter hazardous materials in the soil, groundwater, and soil vapor once construction is completed and the proposed land uses are activated; and the potential for increased fire hazards and interference with an emergency response plan.

The impact analysis assumes that all hazardous materials use during the operation of the project would comply with applicable regulations, including articles 21, 22, and 25 of the health code for the handling of hazardous materials, hazardous wastes, and medical wastes.

With respect to the potential to encounter hazardous materials in the soil, groundwater, and soil vapor during project operations, the impact analysis assumes that PG&E has or will implement regional board approved remediation plans and prepare an approved risk management plan to ensure that each of the remediation areas of the Power Station and PG&E sub-areas are suitable for commercial and industrial land uses. However, the project may develop residential land uses on all of the remediation areas and could develop hotel uses at Block 9 and the Unit 3 Power Block. Day care facilities and recreational areas may also be constructed. The analysis considers whether implementation of applicable regulatory requirements would ensure that potential health risks related to these more sensitive land uses would be less than significant. PG&E is not responsible for remediating the Port, City, and Southern sub-areas; therefore, the analysis for these areas considers applicable regulatory requirements, including compliance with article 22A of the health code.

Similarly, the impact analysis assumes that the project would comply with the San Francisco Building and Fire codes which address impacts related to fire hazards and impairment or interference with an adopted emergency response plan or emergency evacuation plan.

Methodology for Analysis of Cumulative Impacts

Impacts from hazards and hazardous materials are generally site specific, and do not result in cumulative impacts unless the potentially cumulative projects are near one another. Accordingly, the geographic scope of potential hazards and hazardous materials-related impacts is limited to the project site and adjacent sites. The cumulative analysis utilizes a list-based approach to analyze the potential for cumulative physical effects of the project in combination with past, present, and reasonably foreseeable future projects in the immediate vicinity. Similar to the analysis for project impacts, the cumulative impact analysis assumes that construction and operations of other projects in the immediate vicinity, such as PG&E's remediation activities in the Offshore Sediment area and at the Pier 70 Mixed-Use District project area adjacent to the project site, would also comply with applicable regulations. including the Construction General Stormwater Permit; articles 21, 22, 22A, 22B, and 25 of the health code; air district Rule 11, Regulation 2; section 327 of the San Francisco Existing Building Code; the CalOSHA Lead in Construction Standard; disposal requirements for universal wastes; and the San Francisco Building and Fire Codes. The analysis considers whether or not there would be a significant, adverse cumulative impact associated with project implementation in combination with past, present, and reasonably foreseeable future projects in

the immediate vicinity, and if so, whether or not the project's contribution to the cumulative impact would be significant (i.e., cumulatively considerable).

Impact Evaluation

Impact HZ-1: Construction and operation of the proposed project would not create a significant hazard through routine transport, use, or disposal of hazardous materials. ***(Less than Significant)***

The proposed project would use hazardous materials during both construction and operation, and could use explosives for controlled rock fragmentation during construction. Impacts related to this use are discussed below along with regulations that are in place to ensure that impacts related to the use of hazardous materials would be less than significant.

Construction

During construction of the proposed project, diesel fuel and hazardous materials such as paints, fuels, solvents, and adhesives would be used. An inadvertent release of large quantities of these materials into the environment could adversely affect soil and bay water quality. As described in Section 4.J, Hydrology and Water Quality, the proposed project would be subject to the Construction General Stormwater Permit issued by the regional board, and an Erosion Control Plan would be required under article 4.1 of the San Francisco Public Works Code. In accordance with these regulatory requirements, the project sponsor would also be required to prepare and implement a Storm Water Pollution Prevention Plan and Erosion Control Plan to minimize construction-related water quality impacts.

The Storm Water Pollution Prevention Plan and Erosion Control Plan would identify hazardous materials sources within the construction area and recommend site-specific best management practices (i.e., stormwater controls) to prevent discharge of these materials into stormwater and bay waters. The minimum best management practices that would be required include: maintaining an inventory of materials used onsite; storing chemicals in water-tight containers protected from rain; developing a spill response plan and procedures to address hazardous and nonhazardous spills; maintaining spill cleanup equipment onsite; assigning and training spill response personnel; and preventing leaked oil, grease, and fuel from equipment from entering the storm drain or bay. Per the Construction General Stormwater Permit, the project sponsor must ensure that the construction site is visually inspected weekly, and daily during rain events, and must implement corrective actions if any shortcomings are identified. If a discharge of pollutants to the bay were indicated, the discharge would be sampled in accordance with the General Construction Stormwater Permit.

During construction, the contractor could also use explosives for controlled rock fragmentation in locations where the Franciscan bedrock is not rippable with standard excavation equipment. Under section 776 of the Public Works Code (described in Section 4.K.3, Regulatory Framework above, under “San Francisco Public Works Code – Blasting,” p. 4.K-38), the contractor would obtain a permit for the use of explosives from San Francisco Public Works. While the rock fragmentation is occurring, the contractor would use and store the explosives in accordance with the California

General Industry Safety Order for Explosives (described in the Regulatory Framework above, under "Transport, Use, and Storage of Explosive Materials"), which would ensure that they are stored in the appropriate type of magazine protected from damage, and that they would not be inappropriately or accidentally ignited. Compliance with these regulations would ensure the safe handling and use of explosives during construction.

Further, the vendors and contractors responsible for delivery of hazardous materials would be required to comply with the regulations of the California Highway Patrol and the California Department of Transportation related to the transportation of hazardous materials during construction (described above under "State Regulations," p. 4.K-29).

With implementation of these regulatory requirements, including any applicable future updates, impacts related to the routine use, transport, and disposal of hazardous materials during construction would be ***less than significant***.

Operation

Commercial businesses, offices, restaurants, hotel, and residential uses would use common types of hazardous materials such as cleaners, disinfectants, and chemical agents required to maintain the sanitation of public use and residential areas, commercial bathrooms, and food preparation areas. These commercial products are labeled to inform users of potential risks and to instruct them in appropriate handling procedures. When tenant spaces are maintained, remodeled, or sold, the maintenance and renovation activities would also include the use of paints, glues, and other materials similar to those used during construction. Life science and R&D uses could involve the use of other hazardous materials for research purposes that may be toxic, flammable, ignitable, reactive, oxidizing, or explosive. Operations, including proposed commercial and retail uses, may also result in the production of minor amounts of hazardous waste requiring offsite disposition such as disposal or recycling. Life science and R&D uses could also produce medical wastes.

In addition, as described in Section 4.G, Air Quality, 12 parcels would include buildings with back-up generators (14 generators total), and the proposed wastewater pump station would also include an emergency generator. All back-up generators would operate in emergency situations and would be periodically tested. The generators would use diesel fuel.

However, as described above under "Local Regulations," the use and storage of hazardous materials during project operations would comply with the requirements of article 21 of the health code, and the management of hazardous wastes would be conducted in accordance with article 22 of the health code, which provides for the safe handling of hazardous materials and wastes in San Francisco. Life science and R&D uses that generate medical wastes would be required to manage these wastes in accordance with article 25 of the health code.

Under article 21, any facility that handles hazardous materials, including hazardous wastes, in excess of specified quantities would be required to obtain a Certificate of Registration from the San Francisco Department of Public Health and to implement a hazardous materials business plan that includes inventories, a program for reducing the use of hazardous materials and generation of hazardous wastes, site layouts, a program and implementation plan for training all new employees

and annual training for all employees, and emergency response procedures and plans. Under article 22 of the health code, generators of hazardous waste must pay an annual fee to the health department, based on the quantity of hazardous wastes generated annually. Under article 25, medical waste generators would also obtain a permit from the health department, file a medical waste management plan, and maintain individual treatment and tracking records. The medical waste generator would also have an emergency action plan and waste transporters must be appropriately licensed.

Further, the vendors responsible for delivery of hazardous materials would comply with the regulations of the California Highway Patrol and the California Department of Transportation related to the transportation of hazardous materials during construction (described above under "State Regulations").

With implementation of these regulatory requirements, including any applicable future updates, impacts related to the routine use, transport, and disposal of hazardous materials during operation would be ***less than significant***.

Mitigation: None required.

Impact HZ-2: Demolition and renovation of buildings during construction would not expose workers or the public to hazardous building materials including asbestos-containing materials, lead-based paint, PCBs, di (2-ethylhexyl) phthalate (DEHP), and mercury, or result in a release of these materials into the environment. *(Less than Significant)*

Construction

As described in Chapter 2, Project Description, the project would rehabilitate and convert the Unit 3 power block and Stack for a new purpose such as a hotel and retail uses. Alternatively, Block 9 could be improved with a residential use instead of a hotel, in which case, the Unit 3 power block would be demolished. The project would also demolish approximately 20 buildings and structures on the project site. All of these buildings were constructed as part of the historical power generating and industrial activities at the project site. Based on their age, hazardous building materials may have been used in their construction. In all cases the Stack would be preserved. No PCB-containing transformers currently remain on the project site.

Workers and the public could be exposed to hazardous building materials if they are not removed or abated prior to demolition or renovation of the existing buildings and utility systems. However, as described above under "State Regulations" and "Local Regulations," there is a well-established regulatory process that must be followed for ensuring adequate abatement of these materials prior to building demolition or renovation.

Asbestos-Containing Materials

In accordance with air district Regulation 11, Rule 2 (discussed above under "State Regulations"), the project sponsor would be required to retain a qualified contractor to survey each building scheduled for demolition or renovation and each utility system planned for demolition in order to identify asbestos-containing materials. If asbestos-containing materials are identified, the project sponsor would retain a qualified asbestos removal contractor certified as such by the Contractors State License Board to remove the regulated materials prior to demolition or alteration activities. During removal activities, the contractor would implement controls to ensure that there are no visible asbestos emissions to the outside air. This may include methods such as wetting exposed asbestos-containing materials or providing exhaust controls to prevent asbestos emissions from being released to the outside air; and constructing containment barrier(s) around the building(s) and maintaining negative air pressure within the containment barrier(s). The removal activities would be conducted in accordance with the state regulations contained in Title 8 of the California Code of Regulations, section 1529, and Title 8 of the California Code of Regulations, sections 341.6 through 341.17. Pursuant to California law, the building department would not issue the building demolition or renovation permit until the project sponsor has complied with the notice and abatement requirements described above.

Compliance with the regulatory requirements described above and implementation of the required procedures prior to building demolition or renovation would ensure that potential impacts due to demolition or renovation of structures with asbestos-containing materials would be ***less than significant***.

Lead-Based Paint

Because all of the buildings that would be demolished or renovated were constructed prior to 1979, and could contain lead-based paint, the project sponsor would be required to implement the requirements of section 327 of the San Francisco Existing Building Code, Work Practices for Lead-Based Paint on Pre-1979 Buildings and Steel Structures (described above under "Local Regulations"). Accordingly, the project sponsor would retain a qualified contractor to abate the lead-based paint prior to demolition or renovation of any building(s). Prior to demolition or renovation, the contractor would provide required notifications. During demolition, the contractor would establish containment barriers that are at least as effective at protecting human health and the environment as those in the U.S. Department of Housing and Urban Development Guidelines (the most recent Guidelines for Evaluation and Control of Lead-Based Paint Hazards); protect the ground from contamination during exterior work; protect floors and other horizontal surfaces from work debris during interior work; and make all reasonable efforts to prevent migration of lead paint beyond containment barriers during the course of the work. At the completion of abatement activities, the contractor would demonstrate compliance with the clean-up standards of section 327 that require removal of visible work debris, including the use of a high efficiency particulate air vacuum following interior work Pursuant to section 327, the building department would not issue the building demolition or renovation permit until the project sponsor has complied with the requirements described above.

Demolition of other structures that include lead-containing materials, and the renovation of the Unit 3 Power Block, could also result in exposure of workers and the public to lead. However, these

activities would be subject to the CalOSHA Lead in Construction Standard (Title 8 of the California Code of Regulations, section 1532.1) described above under "State Regulations." This standard requires development and implementation of a lead compliance plan when materials containing lead would be disturbed during construction. The plan must describe activities that could emit lead, methods that will be used to comply with the standard, safe work practices, and a plan to protect workers from exposure to lead during construction activities. Measures to reduce and maintain low levels of worker exposure to lead include implementing good housekeeping practices, providing adequate hand and face washing facilities, providing worker training, and using proper respirators. CalOSHA would require 24-hour notification if more than 100 square feet of materials containing lead would be disturbed.

Any lead-based paint during abatement activities would be consolidated and disposed of at a permitted facility in accordance with applicable law. Implementation of procedures required by section 327 of the San Francisco Existing Building Code and the Lead in Construction Standard, along with legal disposal of the lead-based paint by the project sponsor, would ensure that potential impacts related to demolition or renovation of structures with lead-based paint would be ***less than significant***.

Other Hazardous Building Materials

Other hazardous building materials that are likely present within the buildings to be demolished or renovated include fluorescent light ballasts that could contain PCBs or DEHP; fluorescent lamps that contain mercury vapors; electrical switches and thermostats that could also contain mercury or PCBs; and caulking or paints that could contain PCBs. Disruption or disturbance of these materials could pose health threats for construction workers if not properly disposed of. However, prior to demolition or renovation, the project sponsor, through its contractor, would remove these items and dispose of them in accordance with the established regulations described above under "State Regulations." Therefore, through compliance with regulatory requirements, impacts related to exposure to PCBs, DEHP, and mercury in these materials would be ***less than significant***.

Operation

The Unit 3 Power Block could be renovated and reused under the proposed project. This structure could contain asbestos-containing materials and lead-based paint as well as other hazardous building materials such as fluorescent lamps, PCB-containing light ballasts, and mercury switches and thermostats. However, these materials would be required to be abated and/or removed during the construction phase of the proposed project, prior to reuse of Unit 3, as discussed above. Therefore, site occupants and the public would not be exposed to hazardous building materials during operation of the proposed project, and this impact would be ***less than significant***.

Mitigation: None required.

Impact HZ-3: Project development within the Power Station and PG&E sub-areas would be conducted on a site included on a government list of hazardous materials sites, but would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. ***(Less than Significant)***

As discussed in the Environmental Setting, both the Power Station and PG&E sub-areas are identified in numerous environmental databases. In addition, environmental investigations have identified chemicals of concern such as polynuclear aromatic hydrocarbons, PCBs, petroleum hydrocarbons; benzene, toluene, ethylbenzene, and xylenes; and metals in both sub-areas. Methane was detected at a maximum concentration of 20.8 percent in the Northeast remediation area of the Power Station sub-area and naturally occurring asbestos is present in the fill materials and bedrock throughout the site. The discussion below analyzes impacts related to exposure to these materials during construction and operation of the proposed project. Operational impacts are discussed first because as described above under "Overview of Site Remediation Process," the human health risk assessment and risk management plan governing hazardous materials control measures are largely based on proposed future land uses.

Operation

Independent of the proposed project, PG&E has implemented or will implement remediation plans that require approval by the regional board. PG&E is responsible for preparing risk management plans for each remediation area that are designed to ensure that each of the remediation areas of the Power Station and PG&E sub-areas are suitable for commercial and industrial land uses. The risk management plans are subject to approval by the regional board, and the land use covenant on each sub-area will require implementation of the specified risk management measures and also restrict future land uses to commercial and industrial. Residential, hospital, day care, and school uses will be prohibited in both sub-areas without further risk assessments and implementation of the necessary measures to reduce risks related to these sensitive land uses. The 2016 PG&E Restrictions that applies to the Power Station sub-area specify the requirements for approval of additional land uses that may occur on the project site.

The project would develop residential land uses within both the Power Station and PG&E sub-areas and could develop hotel uses on Block 9. Child care uses may also be implemented. Once the site is developed, site occupants, visitors, and maintenance workers could be exposed to hazardous materials in the soil and future residents could potentially be exposed to chemicals in the soil vapors as a result of vapor intrusion. However, potential health risks related to these more sensitive land uses would be addressed by the project sponsor through development of a risk evaluation as required by the 2016 PG&E Restrictions for the Power Station sub-area and the January 2012 Site Management Plan for the PG&E sub-area. The regional board may require additional sampling to complete the risk evaluation.

If the risk evaluation demonstrates that there would be unacceptable health risks (i.e., greater than one in a million incremental cancer risk or a non-cancer hazard index greater than 1) under the proposed land uses, the project sponsor would be required to conduct site remediation and/or incorporate measures into the building and site designs to minimize or eliminate site risks. As

described above under Setting, consistent with the 2016 PG&E Restrictions, the project sponsor would also be required to implement measures to control the intrusion of methane vapors into all building designs. Example remedial activities and potential site design features to manage site risks could include localized soil excavation and offsite disposal, localized in-situ soil stabilization, soil vapor mitigation (e.g., sub-slab venting systems), more robust durable cover specifications, and/or more robust monitoring and maintenance activities.

If the risk evaluation relies on engineering controls (site design features) to reduce site risks under the proposed land uses, the project sponsor would be required to prepare and implement a risk management plan specifying measures to minimize or eliminate exposure pathways to chemicals in the soil and groundwater, and achieve health-based goals (an excess cancer risk of one in a million and a hazard index of 1). At a minimum, the risk management plan would include:

- Regulatory-approved cleanup levels for the proposed land uses;
- A description of existing conditions, including a comparison of site data to regulatory-approved cleanup levels;
- Regulatory oversight responsibilities and notification requirements;
- Post-development risk management measures, including management measures for the maintenance of engineering controls (e.g., durable covers, vapor mitigation systems) and site maintenance activities that could encounter contaminated soil;
- Monitoring and reporting requirements; and
- An operations and maintenance plan, including annual inspection requirements.

The risk management plan, if determined to be necessary, would be submitted to the regional board for review and approval prior to the start of ground disturbance, and it would also include the construction measures discussed below.

If the risk evaluation demonstrates that risks would be within acceptable levels (less than one in a million incremental cancer risk or a non-cancer hazard index less than 1) under a project-specific development scenario, no risk management plan would be required.

The risk evaluation, remedial measures (if required), proposed site design, and risk management plan would be reviewed and approved by the regional board. A land use covenant would be executed, which would require implementation of the risk management measures and also would restrict future uses of the project site, as appropriate.

In addition, the permanent land use restrictions in the 2016 PG&E Restrictions would continue to apply to the Power Station sub-area. Specifically, single family residences and use of groundwater for domestic purposes would be prohibited in the Power Station sub-area.

On the basis of the information provided above, with the implementation of applicable requirements of the 2016 PG&E Restrictions for the Power Station sub-area and the January 2012 Site Management Plan for the PG&E sub-area and any subsequent regulatory requirements,

impacts related to exposure to hazardous materials in the soil, groundwater, and soil vapor during operation in the Power Station and PG&E sub-areas would be ***less than significant***.

Construction

During construction, including excavation for new structures and utilities, the public (including students and staff at nearby schools as well as occupants of offsite residences and developments on adjacent parcels) could be exposed to chemicals of concern through inhalation of airborne dust, contact with accumulated dust, and contaminated runoff, potentially resulting in adverse health effects. However, as discussed above and in the Environmental Setting, under "Potrero Power Station Sub-Area Land Use Covenant," prior to development of the project site, the project sponsor would be required to conduct a human health risk assessment for the proposed land uses; implement site design measures to control risks related to exposure to chemicals in soil, groundwater, and soil vapors; and implement a risk management plan.

Construction-related risk management measures in the risk management plan would describe actions to be implemented during construction and would provide for the protection of public health, including nearby schools and other sensitive receptors. The measures would also ensure appropriate disposition of soil and groundwater removed from the site. The specific construction-related measures would include:

- A project-specific health and safety plan;
- A description of required access controls;
- Soil management protocols for soil movement, soil stockpile management, and import of clean soil;
- A dust control plan specifying measures to be conducted in accordance with the California Air Resources Board Asbestos Air Toxics Control Measure for control of naturally occurring asbestos (Title 17 of California Code of Regulations, section 93105), article 22B of the San Francisco Health Code, and other applicable regulations;
- A stormwater pollution prevention control plan specifying measures to be conducted in accordance with the State Water Resources Control Board's *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ*) and article 4.1 of the San Francisco Public Works Code;
- Parameters for determining the appropriate method of offsite soil disposal;
- A project-specific groundwater management plan for temporary dewatering;
- Risk management measures to minimize the potential for new utilities to become conduits for the spread of groundwater contamination;
- Appropriate design of underground pipelines to prevent the intrusion of groundwater or degradation of pipeline construction materials by chemicals in the soil or groundwater;
- Methods for restoring the integrity of the previously existing durable cover should any activities disturb the durable cover; and
- Protocols for unforeseen conditions.

The risk management plan and all subordinate plans prepared in accordance with the risk management plan would be submitted to the regional board for review and approval.

In the event that an equivalent document, such as an existing PG&E risk management plan, adequately addresses the above topics and has been approved by the regional board, the project sponsor may request approval from regional board to implement the equivalent document rather than prepare a separate risk management plan.

On the basis of the information provided above, with implementation of regulatory requirements described above, impacts related to exposure to hazardous materials in soil, groundwater, and soil vapors during construction in the Power Station and PG&E sub-areas would be ***less than significant***.

Mitigation: None required.

Impact HZ-4: Construction and operation of developments within the Port, City, and Southern sub-areas could encounter hazardous materials in the soil and groundwater, but would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. ***(Less than Significant)***

Under the proposed project, the Port, City, and Southern sub-areas would not be developed for residential or commercial purposes. The western portion of the Port sub-area and all of the City and Southern sub-areas would be covered by 23rd Street. The shoreline portion of the Port sub-area would be developed as public open space. These areas were not part of the former Potrero Power Plant property and are not subject to the land use covenants that apply to that property. No sampling has been conducted to evaluate soil quality in these areas, with the exception of the shoreline portion of the Port property. However, based on their proximity to the former power plant, soil in these areas are likely to contain chemicals of potential concern such as polynuclear aromatic hydrocarbons; PCBs; petroleum hydrocarbons; benzene, toluene, ethylbenzene, and xylenes; and metals. The soil also is likely to contain naturally occurring asbestos and metals.

Development of these areas would be subject to article 22A of the health code (the Maher Ordinance), which is administered and overseen by the health department. Soil disturbance would also be subject to the requirements of the air district Asbestos Airborne Toxics Control Measure. Under article 22A of the health code, the project sponsor would retain the services of a qualified professional to prepare a site history report for the Port, City, and Southern sub-areas that meets the requirements of health code section 22.A.6. The site history report would determine the potential for hazardous materials to be present in the soil and groundwater and the level of exposure risk associated with the project. Based on that information, the project sponsor would conduct soil and/or groundwater sampling and analysis, if required by the health department. If such analysis reveals the presence of hazardous substances in excess of state or federal standards, the project sponsor would submit a site mitigation plan to the health department or other appropriate state or federal agencies, and would remediate any site contamination in accordance with an approved site mitigation plan. The site mitigation plan would include measures for the

control of dust under article 22B of the health code. All required plans and reports would be prepared prior to construction and subject to review and approval by the health department. Any or all of the article 22A requirements may be waived by the health department, at its sole discretion, upon receipt of a Maher application for proposed soil disturbance activities in the Port, City, and Southern sub-areas.

The project sponsor has already initiated the Maher Ordinance application process with the health department. The current agreement with the health department is that an application would be submitted to cover the first two development phases. The application would then be amended for subsequent phases of development. The project sponsor has completed and submitted the initial application package to the health department. This package included all property within in the first two phases of development, including Station A, Power Generating Unit 3, City property along 23rd Street; and all Port property, excluding that area adjacent to the Northeast remediation area. The first amendment would include the Northeast area and the Port property adjacent to the Northeast area. The second amendment will include the balance of the property, namely the Tank Farm area and the PG&E sub-area.

Per the Asbestos Airborne Toxics Control Measure, the project sponsor would prepare an asbestos dust mitigation plan specifying measures that would be taken to ensure that no visible dust crosses the property boundary during construction. The project sponsor would submit the asbestos dust mitigation plan to the air district for approval prior to the beginning of construction, and the site operator would need to ensure the implementation of all specified dust mitigation measures throughout the construction project. In addition, the project sponsor would comply with any air district requirements for air monitoring for offsite migration of asbestos dust during construction activities and any changes to the plan on the basis of the air monitoring results. With implementation of the above regulatory requirements, impacts associated with exposure to hazardous materials in soil, groundwater, and soil vapors in the Port, City, and Southern sub-areas would be ***less than significant*** during both construction and operation.

Mitigation: None required.

Impact HZ-5: The proposed project would not handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Although construction activities would emit diesel particulate matter and naturally occurring asbestos, these emissions would not result in adverse effects on nearby schools. *(Less than Significant)*

Section 15186 of the CEQA Guidelines requires that the environmental document for projects that are located within one-quarter mile of a school address the use of extremely hazardous materials and hazardous air emissions. Certain consultation and notification requirements apply if either of these activities would result in a health or safety hazard to persons who would attend or work at a school. The proposed project would be located within one-quarter mile of La Scuola International School at 728 20th Street, the Dogpatch Alternative School (Site 1 and Site 2), located at 2265 3rd Street and at 610 20th Street, Potrero Kids Preschool, located at 810 Illinois Street, and

Friends of Potrero Hill Nursery School, located at 1060 Tennessee Street. The State of California defines extremely hazardous materials and other regulated substances in section 25532 (i) of the Health and Safety Code. Construction of the proposed project would only use common hazardous materials: paints, solvents, cements, adhesives, and petroleum products (such as asphalt, oil, and fuel). None of these materials is considered extremely hazardous under the state's definition. Further, extremely hazardous materials would not be used during operation of the project. Therefore, there is no impact related to the use of these materials within one-quarter mile of a school during either construction or operation of the proposed project.

Toxic air contaminants that constitute hazardous air emissions are listed in Title 17 of the California Code of Regulations, section 93000. As discussed in Section 4.G, Air Quality (Impact AQ-3), construction equipment and vehicular traffic would emit diesel particulate matter and fine particulate matter during construction. Additionally, emergency generators and vehicular traffic would emit diesel particulate matter, fine particulate matter, and some compounds or variations of reactive organic gases during operation. All of these compounds are toxic air contaminants. However, as summarized in Impact AQ-3 the health risk assessment conducted for the proposed project indicates excess cancer risks would be less than 10 in one million with implementation of air quality mitigation measures that would minimize construction and haul truck emissions; provide specifications for the design of the diesel backup generators; and include additional transportation demand management measures for the project. Therefore, for the purposes of this hazardous materials analysis, impacts related to the use of extremely hazardous materials and hazardous emissions within ¼ mile of a school would be *less than significant*.

As discussed in Impacts HZ-3 and HZ-4, construction activities throughout the project site would disturb rock and soil that contain naturally occurring asbestos. Asbestos is also considered a toxic air contaminant by the air board. However, the project sponsor would implement risk management plans for the project site. These risk management plans would include dust control measures in compliance with article 22B of the health code and the air district Asbestos Airborne Toxics Control Measure. Implementation of these measures, including the use of methods such as blasting mats[76] during controlled rock fragmentation, would ensure that no visible dust crosses the property boundary during construction, and would prevent adverse exposure of school occupants to airborne asbestos. Therefore, impacts related to emissions of toxic air contaminants within one-quarter mile of a school during construction would be ***less than significant*** and no mitigation is necessary.

Mitigation: None required.

---

[76] A blasting mat is a reinforced mat that can be used during rock blasting to contain the blast, prevent flying rock, and suppress dust.

Impact HZ-6: The proposed project would not expose people or structures to a significant risk of loss, injury, or death involving fires, nor would it impair implementation of or physically interfere with and adopted emergency response plan or emergency evacuation plan. ***(Less than Significant)***

San Francisco ensures fire safety primarily through provisions of the San Francisco Building Code. Accordingly, the proposed development would be required to comply with the applicable sections of this building code, which requires several fire safety features, such as equipping the building with a fire protection system, constructing the building with noncombustible materials or with a fire-resistive design, and including fire walls, fire barriers, fire partitions, smoke barriers, and smoke partitions in the building. The final building plans would be reviewed by the San Francisco Fire Department of the San Francisco Department of Building Inspection to ensure conformance with these provisions. Consequently, the proposed project would not create a substantial fire hazard or increase the risk of fires above existing levels.

The proposed project could be subject to earthquake hazards as discussed in the initial study under geology and soils (see Appendix B of this EIR). Occupants of and visitors to the proposed development would increase the temporary and permanent localized population along the waterfront. This increased population could contribute to congestion if an emergency evacuation were required after a major earthquake or other emergency. Although not adopted by legislative action, the City has a published Emergency Response Plan, prepared by the Department of Emergency Management as part of the City's Emergency Management Program, which includes plans for hazard mitigation and disaster preparedness and recovery. The Emergency Response Plan contains 16 annexes (similar to appendices) that cover a number of emergency topics. The Earthquake Annex, in particular, sets forth planning assumptions for a series of earthquakes of varying magnitudes on different faults, and sets forth procedures for assessment of damage and injuries, as well as operational response strategies in the event of a major earthquake.

During a major earthquake, glass, and in some cases building cladding, may endanger those on the streets and sidewalks. However, the buildings that would be constructed under the proposed project would be subject to the most up-to-date building and structural standards, and this would reduce the potential for damage in the event of a major earthquake. Therefore, persons attending or living and working in and around the new buildings as well as those passing by would be relatively safer than those in some older existing buildings. The proposed project is required to include provisions for emergency response for visitors and residents of the completed project. These provisions would be integrated and be compatible with existing emergency response plans, and would neither obstruct implementation of the City's Emergency Response Plan, nor interfere with emergency evacuation planning. Through compliance with the existing codes and regulations noted above and implementation of project provisions for emergency response that account for and are compatible with the City's Emergency Response Plan, impacts related to interference with emergency response or evacuation plans would be ***less than significant***, and no mitigation is necessary.

Mitigation: None required.

Cumulative Impacts

Impacts from hazards and hazardous materials are generally site-specific and do not result in cumulative impacts unless the cumulative projects are in close proximity to one another. Accordingly, the geographic scope of potential hazards and hazardous materials is limited to the project site and immediately adjacent sites. Thus, this analysis considers the impacts of the proposed project in combination with those of the Pier 70 Mixed Use District project directly to the north of the project site.

Impact C-HZ-1: The proposed project, in combination with other past, present or reasonably foreseeable future projects in the project vicinity, would not result in a considerable contribution to significant cumulative impacts related to hazards and hazardous materials. (Less than Significant)

As discussed above, the proposed project would not result in any significant impacts with respect to hazards or hazardous materials during construction or operation with implementation of and compliance with applicable regulatory requirements for hazardous materials. All cumulative development in San Francisco would be subject to the same regulatory framework as the project for the transport, use, and storage of hazardous materials (Impact HZ-1) as well as the abatement of hazardous building materials (Impact HZ-2). Compliance with these existing regulations would serve to ensure that cumulative impacts related to these topics are less than significant.

During construction, the proposed project could result in exposure to chemicals as well as naturally occurring asbestos and metals in soils (Impacts HZ-3, HZ-4, and HZ-5), and concurrent construction of cumulative projects adjacent to the project site could also encounter these materials on their sites. However, compliance with the San Francisco Dust Control ordinance (article 22B of the health code) and the Asbestos Airborne Toxics Control Measure by the proposed project and adjacent projects such as the Pier 70 Mixed-Use District project would ensure that the public, students and staff at nearby schools, and site occupants are not exposed to contaminated materials during construction such that there would be no cumulative impact. Therefore, cumulative impacts related to exposure to chemicals as well as naturally occurring asbestos and metals in soil during construction would be *less than significant*.

During operations, the proposed project could expose site occupants, workers, recreational users, and visitors to chemicals in the soil once the project is constructed. However, this project-level effect would be site specific and not result in a cumulative effect from adjacent projects because the same receptors would not be exposed to chemical risks from more than one site. Therefore, there would be no cumulative effects, and cumulative impacts related to exposure to chemicals in soil during operation would be *less than significant*.

With implementation of the City's Emergency Response Plan, which provides a framework for Citywide emergency planning, and compliance with the San Francisco Building Code by all projects, cumulative impacts related to increased fire risks and interference with or impedance of an emergency response plan would be *less than significant*.

For the reasons described above, overall, cumulative impacts related to hazards and hazardous materials would be ***less than significant***.

Mitigation: None required.

CHAPTER 5
Other CEQA Considerations

5.A Growth Inducement

The CEQA Guidelines require that an EIR evaluate the growth-inducing impacts of a proposed action (section 15126.2(d)). A growth-inducing impact is defined in the CEQA Guidelines section 15126.2(d) as:

> [T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth … It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.

A project can have direct and/or indirect growth-inducement potential. Direct growth inducement would result if a project involved construction of new housing that would result in new residents moving to the area. A project can have indirect growth-inducement potential if it were to establish substantial new permanent employment opportunities (e.g., commercial, industrial or governmental enterprises) or if it were to involve a substantial construction effort with substantial short-term employment opportunities and indirectly stimulate the need for additional housing and services to support the new employment demand. Similarly, under CEQA, a project would indirectly induce growth if it were to remove an obstacle to additional growth and development, such as removing a constraint on required public services, utilities, or infrastructure facility. Increases in population could tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. The CEQA Guidelines also require analysis of the characteristics of projects that may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

The project site is primarily located within the Eastern Neighborhoods Priority Development Area (PDA), (which includes East SoMa, Western SoMa, the Mission District, Showplace Square and Potrero Hill, and the Central Waterfront), as well as partially within the Port of San Francisco Waterfront PDA. PDAs as identified in Plan Bay Area 2040 Final, call for an increasing percentage of Bay Area growth to occur as infill development in areas located near transit and where services necessary to daily living are provided in proximity to housing and jobs.[1] With its abundant transit

[1] Association of Bay Area Governments, Plan Bay Area, Priority Development Area Showcase. Available at *http://gis.abag.ca.gov/website/PDAShowcase/*, accessed May 1, 2018.

service and mixed-use neighborhoods, San Francisco is expected to accommodate an increasing share of future regional growth.

As stated under Section 4.C, Population and Housing, Impact PH-1, the addition of up to 3,014 new market-rate and affordable residential units under the maximum residential scenario would increase the residential population on the site by approximately 6,842 persons.[2] The population of San Francisco is projected to increase by 46 percent over a 30-year period to nearly 1,173,952 persons by 2040.[3] The residential population introduced under the proposed project would constitute approximately 1.9 percent of this population increase; therefore, the population increase associated with the proposed project is accounted for within the planned growth for San Francisco.[4] As also described in the Impact PH-1, the proposed retail/restaurant, office, commercial and entertainment uses on the project site would result in total employment of about 5,524 employees under the maximum office scenario, a substantial increase in onsite employment compared to the existing 20 employees.[5] Therefore, the proposed project would increase new housing demand from employment; however, as addressed in Impact PH-1, this demand would be offset by the proposed housing units. Further, as addressed under their respective topics in the EIR, this project-related growth would be served by existing utilities, infrastructure, and public services. In summary, the increase in the residential and employment population on the project site would not result in a substantial or unplanned increase in the population of the project vicinity or the city.

The proposed project also would not indirectly induce substantial population growth in the project area because it would be located on an infill site in an urbanized area and would not involve any extensions of roads or other infrastructure that could enable additional development in currently undeveloped areas. Instead, the proposed project would implement a portion of the planned residential growth within the Eastern Neighborhoods Plan and the Central Waterfront as areas of San Francisco where future growth will be focused. Furthermore, this level of population growth can be accommodated under the City's existing zoning (height and bulk controls), and therefore the existing zoning controls for the project site are not a barrier to growth. Thus, the project would not induce growth by removing a barrier to growth, but would serve to concentrate growth in the project area instead of elsewhere in San Francisco. Based on this analysis, the project would not have a significant growth-inducing impact, and no mitigation is required.

---

2 The Population and Housing analysis considers the "worst-case" scenario, which is the maximum residential scenario, while the proposed project would develop up to 2,682 new units.

3 Plan Bay Area 2040 does not provide a forecast of future population by city, while the 2013 Draft Plan Bay Area provides this detail. Therefore, by considering the 2013 Draft Plan Bay Area forecasts 447,800 households within 469,430 housing units in 2040, with a population of 1,085,730 (Table 14, page 42), this ration can be applied to the Final Plan Bay Area 2040, which provides an updated forecast with San Francisco expected to have 483,700 households. Adhering to the same population generation rates, the Final Plan Bay Area 2040 forecasts of 483,700 households would be expected to result in approximately 507,600 housing units, with an overall population of 1,173,952.

4 The growth from 2010 to 2040 is an estimated 368,717 persons (from 805,235 in 2010). (6,842 project resident/368,717 new city residents = 1.85 percent)

5 Existing onsite employees are associated with the PG&E Subarea at the General Construction Yard (currently used by PG&E for storage and construction); temporary employees associated with hazardous material remediation; and temporary employees associated with the project applicant, California Barrel Company LLC.

5.B Significant and Unavoidable Environmental Impacts

CEQA Guidelines section 15126.2(b) requires that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. As described in Chapter 5, the impacts listed below would be considered significant and unavoidable, even with implementation of feasible mitigation measures. With the exception of the impacts listed below, all other project impacts would be either less than significant or reduced to less-than significant levels by implementation of the identified mitigation measures.

Historic Architectural Resources

- The proposed demolition of individually significant buildings would materially alter, in an adverse manner, the physical characteristics that justify their inclusion in the California Register of Historical Resources. Mitigation measures to prepare appropriate documentation of affected resources and to implement a public interpretation and salvage program would lessen the severity of the impact, but not to a less-than-significant level. (Impact CR-4)

- The proposed demolition of or substantial and adverse alteration to contributing buildings (Station A, the Gate House, the Meter House, the Compressor House, and the Unit 3 Power Block) would materially alter, in an adverse manner, the physical characteristics of the Third Street Industrial District that justify its inclusion in the California Register of Historical Resources. Mitigation measures to prepare appropriate documentation of affected resources and to implement public interpretation and salvage program would lessen the severity of the impact, but not to a less-than-significant level. Proposed alterations to the Boiler Stack, however, could be mitigated to a less than significant level through a rehabilitation design that conforms to the Secretary of the Interior's Standards and implementation of a historic preservation plan and vibration control measures during construction. (Impact CR-5)

- The impacts of the proposed project, in combination with those of past, present, and reasonably foreseeable future projects, would materially alter, in an adverse manner, the physical characteristics of the Third Street Industrial District that justify its inclusion in the California Register of Historical Resources, resulting in a significant cumulative impact. The project's contribution to this impact would be cumulatively considerable. Mitigation measures to prepare appropriate documentation of affected resources, to implement public interpretation and salvage program, to prepare and implement historic preservation plan and protective measures for alteration of the Boiler Stack, and to effect design controls for new construction within the Third Street Industrial District, would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-CR-2)

Transportation and Circulation

- The proposed project would result in a substantial increase in transit demand that could not be accommodated by nearby Muni transit capacity. Mitigation measures to increase capacity on affected Muni routes would lessen the severity of the impact, but not to a less-than-significant level. (Impact TR-4)

- The proposed project would result in a substantial increase in transit delays or operating costs such that significant adverse impacts to Muni would occur. Mitigation including measures to reduce transit delay would lessen the severity of the impact, but not to a less-than-significant level. (Impact TR-5)

- The proposed project, in combination with past, present, and reasonably foreseeable future projects, would contribute considerably to significant cumulative transit impacts related to

transit capacity utilization on Muni routes. Mitigation measures to increase capacity on affected Muni routes would reduce the severity of the impact, but not to a less-than-significant level. (Impact C-TR-4)

- The proposed project, in combination with past, present, and reasonably foreseeable future projects, would contribute considerably to significant cumulative transit impacts related to travel delay or operating costs on Muni. Mitigation including measures to reduce transit delay and travel time impacts on a potential new Muni route would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-TR-5)

Noise and Vibration

- Project construction would cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors, above levels existing without the project. Mitigation including construction noise control measures and noise controls during pile driving and controlled rock fragmentation/rock drilling would lessen the severity of the impact, but not to a less-than-significant level. (Impact NO-2)

- Project traffic would result in a substantial permanent increase in ambient noise levels. Mitigation including measures to incorporate noise-attenuation features in the design of project buildings for sensitive uses at affected locations and to reduce transit delay, which in turn could reduce vehicle trips, would lessen the severity of the impact, but not to a less-than-significant level. (Impact NO-8)

- Construction of the proposed project, in combination with construction of other cumulative development, would cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors, due to overlapping construction activities in proximity to future planned offsite and proposed onsite receptors, resulting in a significant cumulative impact. The project's contribution to this impact would be cumulatively considerable. Mitigation including construction noise control measures and noise controls during pile driving and controlled rock fragmentation/rock drilling would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-NO-1)

- Operation of the proposed project, in combination with other cumulative development would cause a substantial permanent increase in ambient noise levels in the project vicinity due to cumulative traffic noise increases. Mitigation measures to reduce transit delay, which in turn could reduce vehicle trips, would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-NO-2)

Air Quality

- During project construction (including during construction phases that overlap with project operations), the proposed project would generate criteria air pollutants at levels that would violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Mitigation measures to (1) minimize construction emissions for off- and on-road equipment and vehicles, (2) require emission reductions for diesel back-up generators, (3) promote use of green consumer products, (4) electrify loading docks, (5) implement measures to reduce transit delay, which in turn could reduce vehicle trips, (6) implement additional mobile source control measures, and (7) fund or implement a program that would offset the operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact AQ-2)

- During project operations, the proposed project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Mitigation measures to (1) require emission reductions for diesel back-up generators, (2) promote use of green consumer products, (3) electrify loading docks, (4) implement measures to reduce transit delay, which in turn could reduce vehicle trips, and (5) fund or implement a program that would offset the operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact AQ-3)

- The proposed project, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts. Mitigation measures to (1) minimize construction emissions for off- and on-road equipment and vehicles, (2) require emission reductions for diesel back-up generators, (3) promote use of green consumer products, (4) electrify loading docks, (5) implement measures to reduce transit delay, which in turn could reduce vehicle trips, (6) implement additional mobile source control measures, and (7) fund or implement a program that would offset the operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact C-AQ-1)

Wind

- The phased construction of the proposed project could alter wind in a manner that substantially affects public areas on or near the project site. Mitigation measures to identify and mitigate, if determined necessary, interim hazardous wind impacts would lessen the severity of the impact. However, due to unknowns associated with future interim wind conditions and/or the feasibility of interim wind reduction measures, this impact would remain significant and unavoidable, even with mitigation. (Impact WS-2)

5.C Irreversible and Irretrievable Commitments of Resources

In accordance with section 21100(b)(2)(B) of CEQA, and section 15126.2(c) of the CEQA Guidelines, an EIR must identify any significant irreversible environmental changes that could result from implementation of the proposed project. This may include current or future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future uses of non-renewable resources, and secondary or growth-inducing impacts that commit future generations to similar uses. According to the CEQA Guidelines, irretrievable commitments of resources should be evaluated to assure that such current consumption is justified. In general, such irreversible commitments include resources such as energy consumed and construction materials used in construction of a proposed project, as well as the energy and natural resources (notably water) that would be required to sustain a project and its inhabitants or occupants over the usable life of the project.

Construction of the proposed project would require the use of energy, including energy produced from non - renewable resources, and energy would be consumed during the operational period of the proposed project. Construction would also require the commitment of construction materials, such as steel, aluminum, and other metals, concrete, masonry, lumber, sand and gravel, and other

such materials, as well as water. However, new buildings in California are required to conform to energy conservation standards specified in California Code of Regulations Title 24, which are among the most stringent in the United States. The standards establish energy budgets for different types of residential and nonresidential buildings with which all new buildings must comply. In addition, to ensure that all buildings are healthy, sustainable places to live, work, and learn, the San Francisco Green Building Code requirements are designed to reduce energy and water use, divert waste from landfills, encourage alternate modes of transportation, and support the health and comfort of building occupants in San Francisco. New construction in San Francisco must meet all applicable California and local building codes, provide onsite facilities for recycling and composting, and meet the City's green building requirements tied to the Leadership in Energy and Environmental Design (LEED) and GreenPoint Rated green building rating systems, all of which would ensure that natural resources are conserved or recycled to the maximum extent feasible and that greenhouse gas emissions resulting from the project would be minimized. Even with implementation of conservation measures, the consumption of natural resources, including electricity and natural gas, would generally increase with implementation of the proposed project. However, the proposed project would not involve the wasteful, inefficient, or unnecessary consumption of energy resources, as discussed in the initial study (see Appendix B). Overall, this development would be expected to use less energy and water over the lifetime of the proposed buildings than comparable structures not built to these same standards.

As further described in Appendix B, Initial Study, under Topic E.10, Utilities and Service Systems, Impact UT-1, while the proposed project would incrementally increase the demand for water in San Francisco, the estimated increase in demand would be accommodated within available water supplies and current water supply planning. While potable water use would increase, the proposed project would be designed to incorporate water-conserving measures, such as low-flush toilets and urinals, as required by the San Francisco Green Building Ordinance and the City's Non-potable Water Ordinance. During construction activities, water may be used for soil compaction and dust control activities. However, as discussed under Section 4.G, Air Quality, San Francisco Public Works Code Article 21 restricts the use of potable water for soil compaction and dust control activities undertaken in conjunction, unless permission is obtained from the San Francisco Public Utilities Commission. Therefore, while the consumption of water would increase as the result of construction and operation of the proposed project, the proposed project would not involve the wasteful, inefficient, or unnecessary use of water resources, as discussed in the initial study (see Appendix B).

Development of the proposed project, an infill project within a developed urban area, would not substantially alter the pattern of land use or transportation in the project vicinity and, therefore, would not commit future generations of the project site and vicinity to any particular land use or transportation pattern, nor would it mean that the project site could not be feasibly redeveloped again at some unknown date in the future.

5.D Areas of Known Controversy and Issues to Be Resolved

On November 1, 2017, the Planning Department issued a Notice of Preparation (NOP) of an EIR on the proposed Potrero Power Station Mixed-Use Development project and made the NOP available on its website. The NOP was sent to governmental agencies, organizations, and persons interested in the proposed project to initiate the 30-day public scoping period for this EIR, which started on November 1, 2017 and ended on December 1, 2017. A scoping meeting was held on November 15, 2017, to solicit comments on the scope of the EIR. The NOP and comments on the NOP are included in Appendix A of this document.

Based on the comments received, controversial issues for the proposed project include:

- Project land uses, consideration of alternate uses, and compatibility of land uses on parcels adjacent to Pier 70;
- Noise from construction, operational traffic, and generators on sensitive receptors;
- Impact from exposure to air pollutants during construction and operation on sensitive receptors;
- Wind and shadow impacts generated by the project and cumulatively by the project and Pier 70, with particular concern to recreation resources and the bay;
- The approach to the transportation impact analysis, reasons for the assumptions incorporated (specifically into mode share), employees by different income brackets and miles travelled, times of day and week studied, and cumulative projects considered;
- Impacts on transportation and circulation (including highways, arterial streets, local streets, transit stations and service, and emergency response);
- The project's assumptions and analysis for onsite parking demand and supply;
- Impacts associated with site remediation or management of soils during project construction;
- Project consistency with McAteer-Petris Act, Bay Plan, Coastal Zone Management Act, and with San Francisco Bay Conservation and Development Commission (BCDC) jurisdiction – including with respect to 100-foot shoreline band compliance, BCDC related permits, public access, remediation and sea level rise;
- Impacts to onsite historic buildings (including the Meter House, the Compressor House, Station A, and the Gate House) and consideration of their preservation and possibilities for reuse;
- Impacts related to affordable housing and jobs housing balance by the project;
- Financing, (including fair share contribution), monitoring, scheduling, and responsibility for implementation of mitigation measures; and
- Cumulative impacts of development of the project combined with development of other projects (including Pier 70), and development under other plans, in the vicinity.

This page intentionally left blank

CHAPTER 6
Alternatives

6.A Introduction

This chapter presents the alternatives analysis as required by the California Environmental Quality Act (CEQA) for the proposed Potrero Power Station Mixed-Use Development project (proposed project). The discussion includes the methodology used to select alternatives to the proposed project for detailed CEQA analysis, with the intent of developing potentially feasible alternatives that could avoid or substantially lessen the significant impacts identified for the proposed project while still meeting most of the project's basic objectives. This chapter identifies a reasonable range of alternatives that meet these criteria, and these alternatives are evaluated for their comparative merits with respect to minimizing adverse environmental effects. For the alternatives selected for detailed analysis, this chapter evaluates the alternatives' impacts against existing environmental conditions and compares the potential impacts of the alternatives with those of the proposed project. Based on this analysis, this chapter then identifies the environmentally superior alternative. Finally, other alternative concepts that were considered but eliminated from detailed consideration are described along with the reasons for their elimination.

6.A.1 CEQA Requirements for Alternatives Analysis

The CEQA Guidelines, section 15126.6(a), state that an environmental impact report (EIR) must describe and evaluate a reasonable range of alternatives to the proposed project that would feasibly attain most of the project's basic objectives, but that would avoid or substantially lessen any identified significant adverse environmental effects of the project. An EIR is not required to consider every conceivable alternative to a proposed project. Rather, it must consider a reasonable range of potentially feasible alternatives that will foster informed decision-making and public participation.

CEQA, the CEQA Guidelines, and the case law on the subject have found that feasibility can be based on a range of factors and influences. CEQA Guidelines, section 15364, defines "feasibility" as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors." CEQA Guidelines section 15126.6(f)(1) states that the factors that may be taken into account when addressing the feasibility of alternatives include site suitability, economic viability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries (projects with a regionally significant impact should consider the regional context), and whether the proponent can reasonably acquire, control, or otherwise have access to the alternative site (if the site is not already owned by the proponent).

The EIR must evaluate the comparative merits of the alternatives and include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. Specifically, the CEQA Guidelines set forth the following criteria for selecting and evaluating alternatives:

- "An EIR shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. 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. An EIR is not required to consider alternatives which are infeasible." (section 15126.6[a])

- "[T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." (section 15126.6[b])

- "The range of potential alternatives shall include those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects." (section 15126.6[c])

- "The specific alternative of 'no project' shall also be evaluated along with its impact." (section 15126.6[e][1])

- "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could feasibly attain most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision-making." (section 15126.6[f])

6.A.2 Organization of this Chapter

This chapter is divided into five main sections. Section 6.A is this introductory section. Section 6.B describes the basis for selecting the alternatives analyzed in this EIR; it reviews the project objectives, summarizes the significant impacts of the project that were identified in Chapter 4, and describes the alternatives screening and selection process. Section 6.C provides a detailed description of each of the selected alternatives and summarizes their ability to meet the project objectives.

Section 6.D presents the detailed alternatives analysis and evaluates the environmental impacts of each of the alternatives, compared to those of the proposed project and relative to each other; it is organized by resource topic and compares the impacts of the alternatives to the impacts of the proposed project and to one another. Section 6.D identifies the environmentally superior alternative. The last section, section 6.E, discusses alternative concepts considered but rejected from further study.

6.B Alternatives Selection

This section describes the basis for determining the range of CEQA alternatives and identifies the specific alternatives that are analyzed in this EIR.

6.B.1 Project Objectives

As presented in Chapter 2, Project Description, the project sponsor has identified 16 objectives of the project, which are reiterated below for use in the identification, selection, and evaluation of alternatives. As noted above, an EIR need only consider alternatives that would feasibly accomplish most of the project's basic objectives.

The project sponsor's objectives of the proposed project are to:

- Redevelop the former power plant site to provide a mix of residential, retail, office, Production, Distribution, and Repair (PDR), research and development (R&D) space, a hotel, and activated waterfront open spaces to support a daytime population in a vibrant neighborhood retail district and to provide employment opportunities within walking distance to residents of the surrounding neighborhood.

- Provide access to San Francisco Bay and create a pedestrian- and bicycle-friendly environment along the waterfront, by opening the eastern shore of the site to the public and extending the Bay Trail and the Blue Greenway.

- Provide active open space uses such as playing fields and a playground to improve access to sports, recreational, and playground facilities in the Dogpatch, Potrero Hill, and Bayview-Hunters Point neighborhoods and complement other nearby passive open space uses and parks in the Central Waterfront.

- Increase the city's supply of housing to contribute to meeting the San Francisco General Plan Housing Element goals, and the Association of Bay Area Governments' Regional Housing Needs Allocation for San Francisco by optimizing the number of dwelling units, particularly housing near transit.

- Attract a diversity of household types by providing dense, mixed-income housing, including below-market rate units.

- If Pacific Gas and Electric Company (PG&E) relocates its facilities in the PG&E sub-area, it would be redeveloped with community facilities, PDR, and housing in a fashion that provides continuity with the remainder of the project site and vicinity.

- Build a neighborhood resilient to projected levels of sea level rise and earthquakes.

- Incorporate the project and the anticipated adjacent Pier 70 Mixed-Use District project into a single neighborhood, by creating a network of streets and pedestrian pathways that connect to the street and pedestrian network.

- Create an iconic addition to the city's skyline as part of the Dogpatch neighborhood and the Central Waterfront.

- Provide opportunities for outdoor dining and gathering and create an active waterfront in the evening hours by encouraging ground floor retail and restaurant uses with outdoor seating along the waterfront.

- Build adequate parking and vehicular and loading access to serve the needs of project residents, workers, and visitors.

- Construct a substantial increment of new PDR uses in order to provide a diverse array of commercial and industrial opportunities in a dynamic mixed-use environment.

- Create a circulation and transportation system that emphasizes transit-oriented development and promotes the use of public transportation and car-sharing through an innovative and comprehensive demand management program.

- Demonstrate leadership in sustainable development by constructing improvements intended to reduce the neighborhood's per capita consumption of electricity, natural gas, and potable water, and generation of wastewater.

- Create a development that is financially feasible and that can fund the project's capital costs and on-going operation and maintenance costs relating to the redevelopment and long-term operation of the property.

- Construct a waterfront hotel use in order to provide both daytime and nighttime activity on the waterfront promenade.

6.B.2 Summary of Significant Impacts

As stated in the CEQA Guidelines, alternatives to a project selected for analysis in an EIR must substantially lessen or avoid any of the significant environmental impacts associated with the project. The following summarizes the conclusions for potentially significant and significant impacts identified in Chapter 4 of this EIR and in the initial study (see Appendix B).

6.B.2.1 Significant and Unavoidable Impacts

The proposed project was determined to have the following significant and unavoidable impacts, even with implementation of feasible mitigation measures, as described in detail in Chapter 4 of this EIR.

Historic Architectural Resources

- The proposed demolition of individually significant buildings would materially alter, in an adverse manner, the physical characteristics that justify their inclusion in the California Register of Historical Resources. Mitigation measures to prepare appropriate documentation of affected resources and to implement a public interpretation and salvage program would lessen the severity of the impact, but not to a less-than-significant level. (Impact CR-4)

- The proposed demolition of or substantial and adverse alteration to contributing buildings (Station A, the Gate House, the Meter House, the Compressor House, and Unit 3 Power Block) would materially alter, in an adverse manner, the physical characteristics of the Third Street Industrial District that justify its inclusion in the California Register of Historical

Resources. Mitigation measures to prepare appropriate documentation of affected resources and to implement public interpretation and salvage program would lessen the severity of the impact, but not to a less-than-significant level. Proposed alterations to the Boiler Stack, however, could be mitigated to a less than significant level through a rehabilitation design that conforms to the Secretary of the Interior's Standards and implementation of a historic preservation plan and vibration control measures during construction. (Impact CR-5)

- The impacts of the proposed project, in combination with those of past, present, and reasonably foreseeable future projects, would materially alter, in an adverse manner, the physical characteristics of the Third Street Industrial District that justify its inclusion in the California Register of Historical Resources, resulting in a significant cumulative impact. The project's contribution to this impact would be cumulatively considerable. Mitigation measures to prepare appropriate documentation of affected resources, to implement public interpretation and salvage program, to prepare and implement historic preservation plan and protective measures for alteration of the Boiler Stack, and to effect design controls for new construction within the Third Street Industrial District would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-CR-2)

Transportation and Circulation

- The proposed project would result in a substantial increase in transit demand that could not be accommodated by nearby Muni transit capacity. Mitigation measures to increase capacity on affected Muni routes would lessen the severity of the impact, but not to a less-than-significant level. (Impact TR-4)

- The proposed project would result in a substantial increase in transit delays or operating costs such that significant adverse impacts to Muni would occur. Mitigation including measures to reduce transit delay would lessen the severity of the impact, but not to a less-than-significant level. (Impact TR-5)

- The proposed project, in combination with past, present, and reasonably foreseeable future projects, would contribute considerably to significant cumulative transit impacts related to transit capacity utilization on Muni routes. Mitigation measures to increase capacity on affected Muni routes would reduce the severity of the impact, but not to a less-than-significant level. (Impact C-TR-4)

- The proposed project, in combination with past, present, and reasonably foreseeable future projects, would contribute considerably to significant cumulative transit impacts related to travel delay or operating costs on Muni. Mitigation including measures to reduce transit delay and travel time impacts on a potential new Muni route would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-TR-5)

Noise and Vibration

- Project construction would cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors, above levels existing without the project. Mitigation including construction noise control measures and noise controls during pile driving and controlled rock fragmentation/rock drilling would lessen the severity of the impact, but not to a less-than-significant level. (Impact NO-2)

- Project traffic would result in a substantial permanent increase in ambient noise levels. Mitigation including measures to incorporate noise-attenuation features in the design of

project buildings for sensitive uses at affected locations and to reduce transit delay, which in turn could reduce vehicle trips, would lessen the severity of the impact, but not to a less-than-significant level. (Impact NO-8)

- Construction of the proposed project, in combination with construction of other cumulative development, would cause a substantial temporary or periodic increase in ambient noise levels at noise-sensitive receptors, due to overlapping construction activities in proximity to future planned offsite and proposed onsite receptors, resulting in a significant cumulative impact. The project's contribution to this impact would be cumulatively considerable. Mitigation including construction noise control measures and noise controls during pile driving and controlled rock fragmentation/rock drilling would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-NO-1)

- Operation of the proposed project, in combination with other cumulative development, would cause a substantial permanent increase in ambient noise levels in the project vicinity due to cumulative traffic noise increases. Mitigation including measures to reduce transit delay, which in turn could reduce vehicle trips, would lessen the severity of the impact, but not to a less-than-significant level. (Impact C-NO-2)

Air Quality

- During project construction (including during construction phases that overlap with project operations), the proposed project would generate criteria air pollutants at levels that would violate an air quality standard, contribute substantially to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Mitigation measures to (1) minimize construction emissions for off- and on-road equipment and vehicles, (2) require emission reductions for diesel back-up generators, (3) promote use of green consumer products, (4) electrify loading docks, (5) implement measures to reduce transit delay, which in turn could reduce vehicle trips, (6) implement additional mobile source control measures, and (7) fund or implement a program that would offset the operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact AQ-2)

- During project operations, the proposed project would result in emissions of criteria air pollutants at levels that would violate an air quality standard, contribute to an existing or projected air quality violation, or result in a cumulatively considerable net increase in criteria air pollutants. Mitigation measures to (1) require emission reductions for diesel back-up generators, (2) promote use of green consumer products, (3) electrify loading docks, (4) implement measures to reduce transit delay, which in turn could reduce vehicle trips, and (5) fund or implement a program that would offset the operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact AQ-3)

- The proposed project, in combination with past, present, and reasonably foreseeable future development in the project area, would contribute to cumulative regional air quality impacts. Mitigation measures to (1) minimize construction emissions for off- and on-road equipment and vehicles, (2) require emission reductions for diesel back-up generators, (3) promote use of green consumer products, (4) electrify loading docks, (5) implement measures to reduce transit delay, which in turn could reduce vehicle trips, (6) implement additional mobile source control measures, and (7) fund or implement a program that would offset the

operational emissions would substantially lessen the severity of the impact. However, due to the unknowns associated with implementing an emission offset program, this impact is conservatively considered significant and unavoidable, with mitigation. (Impact C-AQ-1)

Wind

- The phased construction of the proposed project could alter wind in a manner that substantially affects public areas on or near the project site. Mitigation measures to identify and mitigate, if determined necessary, interim hazardous wind impacts would lessen the severity of the impact. However, due to unknowns associated with future interim wind conditions and/or the feasibility of interim wind reduction measures, this impact would remain significant and unavoidable, even with mitigation. (Impact WS-2)

6.B.2.2 Significant Impacts that can be Mitigated to Less than Significant

The proposed project was determined to have the following potentially significant impacts, all of which could be mitigated to a less-than-significant level with implementation of identified mitigation measures, as described in detail in Chapter 4 of this EIR and in the initial study (see Appendix B).

Archeological Resources

- The project could cause a substantial adverse change in the significance of an archeological resource. Mitigation measures to conduct archeological testing, monitoring, data recovery, and reporting, as necessary, would reduce this impact to less than significant. (Impact CR-1, initial study)

- The project could disturb human remains, including those interred outside of dedicated cemeteries. Mitigation measures to conduct testing, monitoring, data recovery, and reporting, as necessary, would reduce this impact to less than significant. (Impact CR-2, initial study)

- The project could result in a substantial adverse change in the significance of a tribal cultural resource as defined in CEQA section 21074. Mitigation measures to conduct archeological testing, monitoring, data recovery, and reporting as necessary as well as a tribal cultural resources interpretive program would reduce this impact to less than significant. (Impact CR-3, initial study)

- The proposed project in combination with past, present, and reasonably foreseeable future projects in the vicinity could result in cumulative impacts on archeological resources, human remains, and tribal cultural resources. Mitigation measures to conduct archeological testing, monitoring, data recovery, and reporting, as necessary, as well as a tribal cultural resources interpretive program would reduce this impact to less than significant. (Impact C-CR-1, initial study)

Historic Architectural Resources

- The proposed infill construction could materially alter, in an adverse manner, the physical characteristics of the Third Street Industrial District that justify its inclusion in the California Register of Historical Resources. Mitigation measures to effect design controls for new construction to ensure compatibility with the character of the Third Street Industrial District would reduce this impact to less than significant. (Impact CR-6)

Transportation and Circulation

- The proposed project would not create hazardous conditions for people walking, or otherwise interfere with accessibility for people walking to the site or adjoining areas, but existing pedestrian facilities could present barriers to accessible pedestrian travel. Mitigation measures to improve pedestrian facilities at the intersection of Illinois and 22nd streets would reduce this impact to less than significant. (Impact TR-7)

Noise and Vibration

- Project construction could expose people to or generate noise levels in excess of standards in the Noise Ordinance (Article 29 of the San Francisco Police Code) or applicable standards of other agencies. Mitigation measures to implement a construction noise control measures would reduce this impact to less than significant. (Impact NO-1)

- Project construction would generate excessive groundborne vibration that could result in building damage. Mitigation including vibration control measures during use of vibratory equipment and during pile driving and controlled blasting would reduce this impact to less than significant. (Impact NO-4).

- Operation of the stationary equipment on the project site could result in a substantial permanent increase in ambient noise levels in the immediate project vicinity, and permanently expose noise-sensitive receptors to noise levels in excess of standards in the San Francisco Noise Ordinance. Mitigation measures to implement noise controls on stationary equipment would reduce this impact to less than significant. (Impact NO-5)

Air Quality

- Construction and operation of the proposed project would generate toxic air contaminants, including diesel particulate matter, which could expose sensitive receptors to substantial pollutant concentrations. Mitigation measures to (1) minimize construction emissions for off- and on-road equipment and vehicles, (2) require emission reductions for diesel back-up generators, and (3) appropriately site future land uses that emit toxic air contaminants would reduce this impact to less than significant. (Impact AQ-4)

- The proposed project could conflict with implementation of the Bay Area 2017 Clean Air Plan. Mitigation measures to minimize construction emissions, to electrify loading docks, to implement measures to reduce transit delay, which in turn could reduce vehicle trips, and additional mobile source control measures, and to implement other applicable control measures from the Clean Air Plan would reduce this impact to less than significant. (Impact AQ-5)

- The proposed project, in combination with past, present, and reasonably foreseeable future development in the project area, could contribute to cumulative health risk impacts on sensitive receptors. Mitigation measures to minimize construction emissions for off- and on-road equipment and vehicles would reduce this impact to less than significant. (Impact C-AQ-2)

Biological Resources

- Construction of the proposed project could have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Mitigation measures to protect nesting birds prior to and during construction would reduce this impact to less than significant. (Impact BI-1)

- Construction of the proposed project could have a substantial adverse effect either directly or through habitat modification on bats identified as special-status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or the U. S. Fish and Wildlife Service. Mitigation measures to avoid and minimize impacts on bats prior to and during construction would reduce this impact to less than significant. (Impact BI-3)

- Construction of the proposed project could have a substantial adverse effect, either directly or through habitat modification, on marine 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, U.S. Fish and Wildlife Service, or National Oceanic and Atmospheric Administration. Mitigation measures to protect fish and marine mammals during pile driving would reduce this impact to less than significant. (Impact BI-4)

- Construction of the proposed project could have a substantial adverse effect on San Francisco Bay through direct removal, filling, hydrological interruption, or other means. Mitigation measures to compensate for fill of jurisdictional water as determined by the permitting agencies would reduce this impact to less than significant. (Impact BI-7)

- The proposed project could interfere substantially with the movement of 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. Mitigation measures to protect nesting birds during construction and to protect fish and marine mammals during pile driving would reduce this impact to less than significant. (Impact BI-9)

- The proposed project, in combination with past, present, present, and reasonably foreseeable projects in the site vicinity, could result in a cumulatively considerable contribution to significant impacts on biological resources. Mitigation measures to protect nesting birds, bats, fish and marine mammals and to provide compensation for fill of jurisdictional waters would reduce this impact to less than significant. (Impact C-BI-1)

Paleontological Resources

- The proposed project could directly or indirectly destroy a unique paleontological resource or site. Mitigation measures to conduct paleontological resources and mitigation as required would reduce this impact to less than significant. (Impact GE-6, initial study)

6.B.3 Alternatives Screening and Selection

6.B.3.1 Alternatives Screening

In accordance with CEQA Guidelines section 15126.6(a), this project-level EIR examines a reasonable range of alternatives to the proposed project or to the location of the project. An alternative selected for analysis must meet three criteria: (1) the alternative would attain *most* of the project's basic objectives; (2) the alternative would *avoid or substantially lessen* the significant environmental impacts of the proposed project; and (3) the alternative must be potentially *feasible*. An EIR need not consider an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster informed decision-making and public participation.

Screening Process

The alternatives selection process for the proposed project was based on first identifying strategies that would avoid or lessen the significant impacts identified above, with focus on strategies that address the significant and unavoidable impacts of the proposed project. In most cases where impacts were determined to be less than significant with mitigation, alternative strategies were not warranted because feasible and effective mitigation measures have been identified for avoiding or substantially lessening those impacts.

The alternative strategies were then reviewed for their feasibility, and the potentially feasible strategies were then screened for their ability to meet most of the project objectives. This process resulted in the development of the final project alternatives that were determined to represent a reasonable range of alternatives as described and analyzed in this EIR. As described below, the alternatives selected for detailed analysis include a comprehensive range of historic preservation alternatives—including two full preservation alternatives and four partial preservation alternatives—in combination with a range of reduced development programs. The full preservation alternatives include one with a substantially reduced development program and one with a development program very similar to that of the proposed project, while the four partial preservation alternatives include slight reductions and variations to the development under the proposed project.

Strategies to Avoid or Lessen Significant Impacts

All of the significant and unavoidable impacts identified for the proposed project, as summarized above, can be broken down into the following categories with respect to strategies for avoiding or lessening impacts related to:

- demolition and/or alteration of historic buildings
- increase in transit demand
- noise and air quality effects of construction activities
- increase in vehicles on local roadways (noise, air quality, transit operation impacts)
- increase in operational sources of air emissions (area, stationary, and energy sources)
- construction phasing (potential interim wind hazards)

These strategies were then used to formulate alternatives for analysis in this chapter.

Alternative Strategy to Address Impacts on Historic Architectural Resources

Impacts on historic architectural resources would be avoided or substantially lessened by retaining all or some of the historic resources proposed for demolition and rehabilitating them consistent with the Secretary of the Interior's Standards for Rehabilitation. In March 2018, Page & Turnbull prepared *Potrero Power Station Mixed-Use Development Project Preservation Alternatives Report*,[1] which developed and analyzed a range of project alternatives that would either fully or partially preserve

[1] Page & Turnbull, *Potrero Power Station Mixed-Use Development Project, Preservation Alternatives Report, San Francisco, California*, Prepared for Associate Capital, March 9, 2018.

the historic architectural resources located on the project site. Based on the information in this report, this chapter analyzes two full preservation alternatives and four partial preservation alternatives, which are described and analyzed in detail below. One of the full preservation alternatives is a variation of the full preservation alternative presented in the Page & Turnbull report. This alternative was revised at the direction of the Architectural Review Committee (ARC) of the San Francisco Historic Preservation Commission from the initial Page & Turnbull concept to accommodate a very similar development program to that of the proposed project. The other full preservation alternative entails approximately one-third less overall development than the proposed project, as described further below. Additional details were added to partial preservation alternative 4 at the direction of the ARC. The remaining three partial preservation alternatives are based on the Page & Turnbull report, with minor modifications.

Alternative Strategy to Address Transportation, Noise, and Air Quality Impacts

The significant and unavoidable transportation, noise, and air quality impacts all relate to the operational effects associated with the magnitude and nature of the proposed development; significant and unavoidable noise and air quality impacts also relate to construction activities. Long-term development of over 5 million gross square feet of residential, commercial, and other land uses would introduce over 6,000 new residents and over 5,000 new employees to the project site. As described in Chapter 4, this would generate increases in demand for transit that would exceed capacity thresholds as well as increases in vehicles on local roadways that would affect transit operations and generate noise and criteria air pollutant emissions that would also exceed applicable thresholds. In addition to the mobile sources of air pollutant emissions, stationary and area sources associated with long-term operation of the proposed project (e.g., emergency diesel generators, landscaping equipment, architectural coatings, and consumer products) would generate criteria air pollutant emissions that together with the mobile sources would exceed thresholds for ozone precursors, even with mitigation.

One strategy to reduce these construction and operational impacts is to reduce the magnitude of the development, which in turn could reduce the magnitude and duration of construction as well as the gross square footage of development, the number of new residents and employees, and the associated number of vehicle trips. While this strategy would compromise some of the project's objectives, it could, depending on the degree of reduced development, substantially reduce the severity of the proposed project's significant and unavoidable transportation, noise, and air quality impacts.

As discussed in Section 6.C, below, all of the alternatives selected for detailed analysis represent some degree of reduced development compared to the proposed project. However, the No Project/Code Compliant Alternative (73 percent reduction in gross square feet) and the Full Preservation/Reduced Program Alternative (34 percent reduction in gross square feet) are the two alternatives most likely to substantially reduce the significant and unavoidable transportation, noise, and air quality impacts. These alternatives are described and analyzed in detail below.

Alternative Strategy to Address Interim Wind Hazards

As described in Chapter 4, Section 4.H, the phased construction of the proposed project could result in temporary wind conditions that exceed wind hazards thresholds. At full buildout, the proposed

project would generally improve wind conditions somewhat on the project site, compared to existing conditions, and the project's effect on pedestrian-level wind speeds would be less than significant. However, during the lengthy construction period, a particular building configuration resulting from development of one or more individual structures could result in localized wind conditions that would be worse than are reported for the project as a whole. Because the wind modeling conducted for the project did not consider every permutation of partial buildout scenarios, this EIR conservatively assumes such impacts to be significant. Furthermore, in addition to the unknown wind hazards during partial buildout, the feasibility and effectiveness of interim wind-reduction measures are also unknown. Therefore, this impact was determined to be significant and unavoidable.

No feasible alternative strategies that would meet most of the basic project objectives are available that would substantially reduce or avoid this impact, because the size of the project site requires that construction be conducted in phases and over an extended, multi-year construction period. Mitigation Measure M-WS-2, Identification and Mitigation of Interim Hazardous Wind Impacts, that was identified in Chapter 4, Section 4.H, is the only feasible approach to avoiding or substantially lessening the severity of this potential impact, and even with this mitigation measure, the impact would remain significant and unavoidable due to the uncertain nature of the impacts at any particular stage of construction. Thus, none of the alternatives described and analyzed below other than Alternative A, No Project/Code Compliant Alternative, address this impact, and this same significant and unavoidable impact could potentially occur under all of the other alternatives selected for detailed analysis.

6.C Descriptions of Alternatives Selected for Analysis

Based on the screening process described above, the following seven alternatives were selected for detailed analysis in this EIR:

- Alternative A: No Project/Code Compliant Alternative
- Alternative B: Full Preservation/Reduced Program Alternative
- Alternative C: Full Preservation/Similar Program Alternative
- Alternative D: Partial Preservation 1 Alternative
- Alternative E: Partial Preservation 2 Alternative
- Alternative F: Partial Preservation 3 Alternative
- Alternative G: Partial Preservation 4 Alternative

These seven alternatives were determined to adequately represent the range of potentially feasible alternatives required under CEQA for this project. These alternatives would lessen, and in some cases avoid, significant and unavoidable adverse impacts related to historic architectural resources, transportation, air quality, and noise that were identified for the proposed project. A "no project alternative" is included as Alternative A, as required by CEQA, even though it would not meet the basic project objectives.

Alternatives B through G are all potentially feasible options that would meet most of the basic project objectives to varying degrees; these six alternatives are all full or partial preservation alternatives; the descriptions and assumptions are based mainly on the alternatives presented in the *Preservation Alternatives Report* prepared by Page & Turnbull.[2] However, Alternative B, Full Preservation/Reduced Program Alternative, is not discussed in the Page & Turnbull report but was developed specifically for this EIR alternatives analysis. Alternative C, Full Preservation/Similar Program Alternative, is also not explicitly discussed in the Page & Turnbull report but is a slight variation of one of the full preservation alternatives in that report. Other alternatives considered in the Page & Turnbull report, but not carried forward for detailed analysis and the reasons they were not carried forward, are described in Section 6.E, below.

Table 6-1, **Characteristics of Proposed Project and Alternatives**, summarizes and compares the characteristics of the proposed project with those of Alternatives A through G. For comparison purposes, **Figure 6-1**, **Proposed Project**, depicts the proposed project from an oblique aerial perspective showing the proposed land uses and building massing; **Figures 6-2 through 6-8** depict the seven alternatives from a similar perspective. **Table 6-2**, **Summary of Ability of Alternatives to Meet Project Objectives**, summarizes the ability of each of the alternatives to meet the project objectives.

Detailed descriptions of each alternative are presented below, including the assumptions used in analyzing their environmental impacts. For each alternative, the descriptions include the land use plan, historic resources and transportation features, travel demand assumptions, and construction assumptions. Based on the same methodology used for the proposed project, **Table 6-3**, **Proposed Project and Project Alternatives Person Trip Generation by Time Period**, presents the travel demand for weekday daily, and a.m. and p.m. peak hours for the proposed project and the seven alternatives, and includes both internal and external trips, while **Table 6-4**, **Proposed Project and Project Alternatives Trip Generation By Mode and Time Period**, presents the person trips by mode and vehicle trips for external trips (i.e., the trips arriving to or leaving from the project site).

As with the proposed project, all alternatives, including the no project alternative, assume that PG&E will complete the ongoing environmental remediation for hazardous materials in soils and groundwater at each portion of the project site prior to any development on that portion, and that PG&E's remediation program will achieve clearance for commercial/industrial development, as approved by the San Francisco Regional Water Quality Control Board. Alternatives B through G (Alternative A has no residential uses) assume also that the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), if applicable, and would implement site design measures to control risks related to exposure to chemicals in soil, groundwater, and soil vapors, (including conducting further remediation, if necessary) as approved by the regional board. In addition, this alternatives analysis assumes that all alternatives would be developed to include resiliency to sea level rise and earthquakes and would incorporate sustainability principles in their design.

[2] Page & Turnbull, 2018. Potrero Power Station Mixed-Use Development Project, Preservation Alternatives Report, San Francisco, California. Prepared for Associate Capital, March 9, 2018.

TABLE 6-1
CHARACTERISTICS OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project[a]	Alternative A: No Project/Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Land Uses								
Area of site, acres	29.0	22.9 (does not include 4.8-acre PG&E sub-area or 1.3-acre portion of Port sub-area along 23rd Street)	29.0	29.0	29.0	29.0	29.0	29.0
Residential, dwelling units	2,682	0	1,764	2,681	2,445	2,682	2,459	2,492
Residential, gsf	2,682,427	0	1,764,202	2,681,272	2,444,690	2,682,427	2,458,595	2,491,852
Hotel, rooms	220	0	145	220	220	220	220	220
Hotel, gsf	241,574	0	160,290	241,574	241,574	241,574	241,574	241,574
Commercial (office), gsf	597,723	87,655	450,362	544,228	551,694	488,012	597,723	592,018
Commercial (R&D), gsf	645,738	0	373,747	645,738	645,738	645,738	645,738	645,738
Commercial (PDR), gsf	45,040	1,088,735	29,726	45,040	45,040	45,040	45,040	45,040
Commercial (retail), gsf	107,439	20,768	70,910	107,439	107,439	107,439	107,439	107,439
Community Facilities, gsf	100,938	0	66,619	100,938	100,938	100,938	100,938	100,938
Entertainment/Assembly, gsf	25,000	0	16,500	25,000	25,000	25,000	25,000	25,000
Parking, no. of spaces	2,622	784	1,729	2,585	2,409	2,549	2,487	2,502
Parking, gsf	921,981	274,400	634,032	905,226	857,276	892,276	870,717	875,750
Total Building Area, gsf	5,367,860	1,471,558	3,566,388	5,296,455	5,019,389	5,228,444	5,092,764	5,126,349
Total Building Area, % of project	100%	27%	66%	99%	94%	97%	95%	96%
Open Space, acres	6.2	4.4	6.2	6.2	6.2	6.2	6.2	6.2
Open Space, % of area	21%	19%	21%	21%	21%	21%	21%	21%

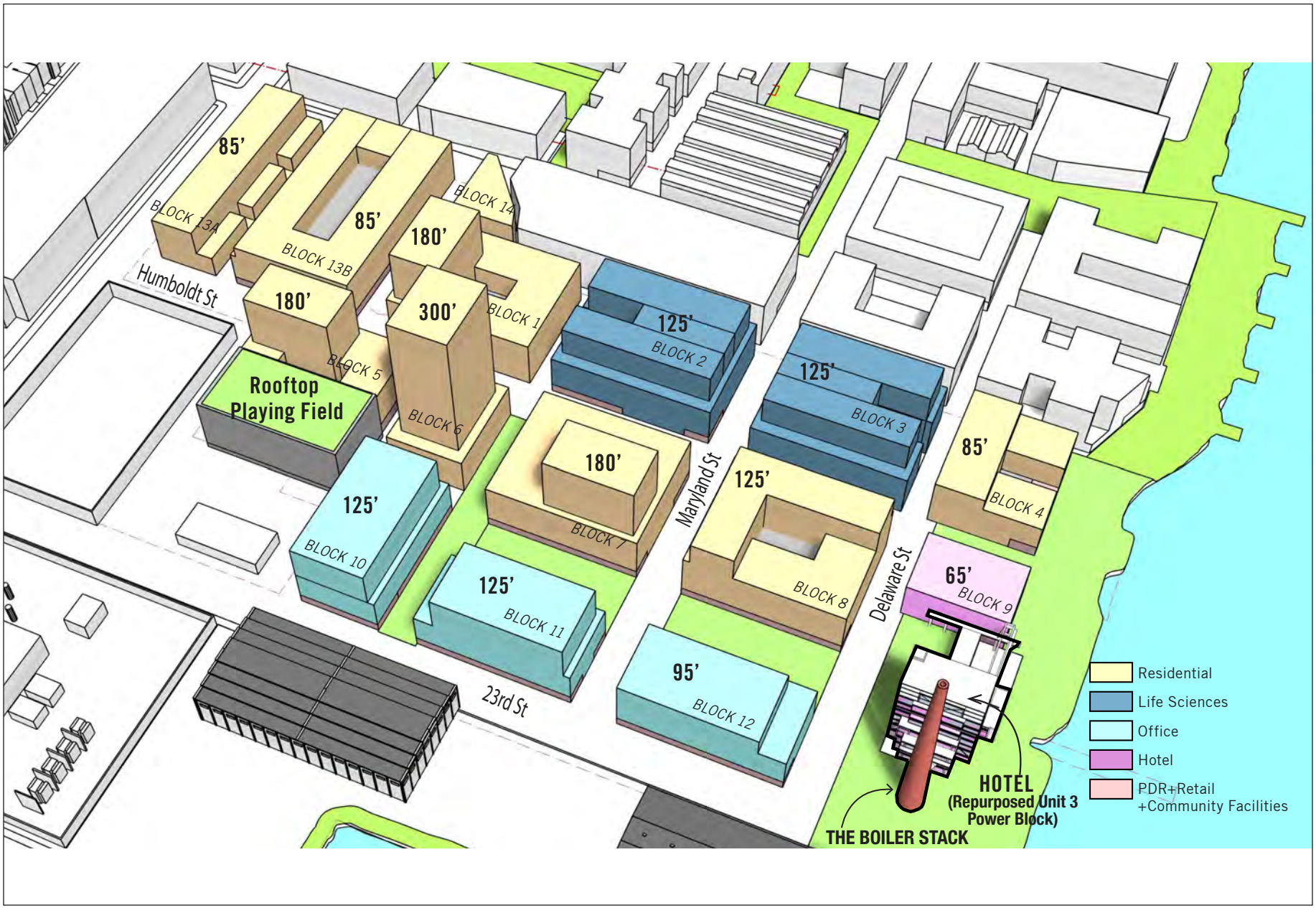
TABLE 6-1 (CONTINUED)
CHARACTERISTICS OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project[a]	Alternative A: No Project/Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Building Characteristics								
Stories, no.	5 to 30	4	4 to 20	5 to 30	5 to 30	5 to 30	5 to 30	5 to 30
Height, feet	65 to 180 ft, one building 300 ft tall	40 ft	45 to 120 ft, one building 200 ft tall	65 to 240 ft, two buildings 300 ft	65 to 180 ft, one building 300 ft tall	65 to 180 ft, one building 300 ft tall	65 to 180 ft, one building 300 ft tall	65 to 180 ft, one building 300 ft tall
Towers (building >180 ft), no.	1 (300-ft tower)	0	1 (200-ft tower)	2 (300-ft towers) 2 (240-ft towers)	1 (300-ft tower)	1 (300-ft tower)	1 (300-ft tower)	1 (300-ft tower)
Residential Buildings, LEED gold standard	Yes	No (no residential uses)	Yes	Yes	Yes	Yes	Yes	Yes
Transportation Features								
Bicycle Parking, Class 1, no.	1,577	123	1,114	1,413	1,357	1,556	1,446	1,454
Bicycle Parking, Class 2, no.	373	52	291	349	333	345	333	338
Space for future Muni bus stop on 23rd Street	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Sidewalk Improvements, Illinois St (same as project)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Signal on Illinois/23rd (same as project)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Signal on Illinois/Humboldt (same as project)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Bay Trail (same as project)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
TDM Plan (same as project)	Yes	No, but would comply with TDM Ordinance	Yes	Yes	Yes	Yes	Yes	Yes
Transit Shuttle Service (same as project)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 6-1 (CONTINUED)
CHARACTERISTICS OF PROPOSED PROJECT AND ALTERNATIVES

Characteristic	Proposed Project[a]	Alternative A: No Project/Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Other Features								
Dock	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Rooftop Playing Field	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Onsite Historical Resources[b]								
Station A	Demolish	Demolish	Rehabilitate	Rehabilitate	Rehabilitate	Rehabilitate southern portion to the extent feasible; demolish northern portion	Demolish	Retain façade, new vertical construction within and above
Meter House	Demolish	Demolish	Rehabilitate	Rehabilitate	Demolish	Demolish	Rehabilitate	Retain façade new vertical construction within and above
Compressor House	Demolish	Demolish	Rehabilitate	Rehabilitate	Demolish	Demolish	Rehabilitate	Retain façade, new vertical construction within and above
Gate House	Demolish	Demolish	Rehabilitate	Rehabilitate	Demolish	Demolish	Demolish	Demolish
Unit 3 Power Block	Retain or Demolish	Demolish	Rehabilitate	Rehabilitate	Retain	Retain	Retain	Retain
Unit 3 Boiler Stack	Retain	Retain	Rehabilitate	Rehabilitate	Rehabilitate	Rehabilitate	Rehabilitate	Rehabilitate
Construction								
Start Date [c]	2020	2020	2020	2020	2020	2020	2020	2020
End Date	2034	2026	2030	2034	2034	2034	2034	2034
Total Duration, years	15	7	11	15	15	15	15	15
Construction phases	6	3	6	6	6	6	6	6

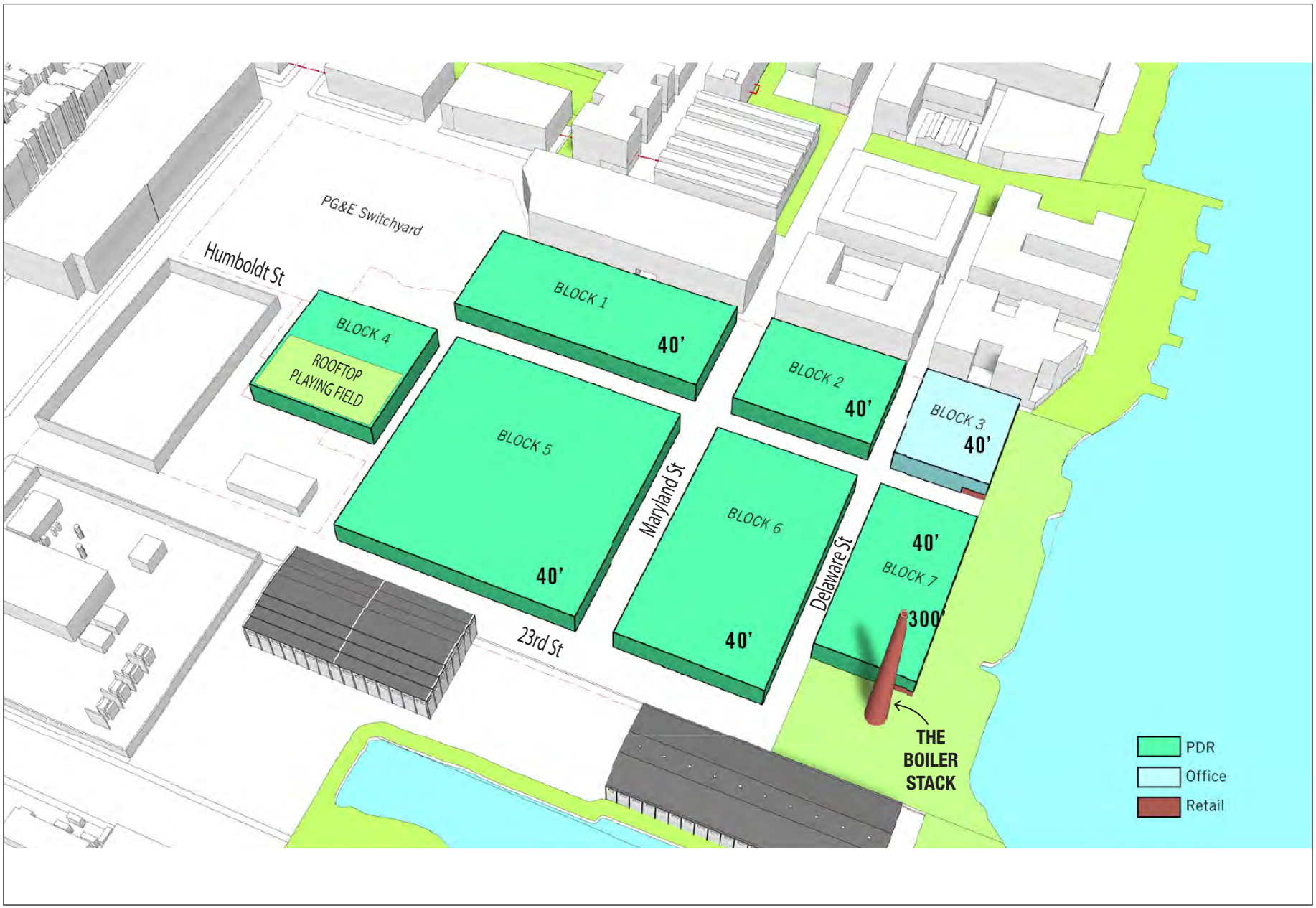
[a] Represents the preferred project characteristics, which includes the anticipated but not the range of development of flex blocks. See Chapter 2, Project Description, for full description.
[b] "Demolish" means the building would be entirely demolished. "Rehabilitate" means the project would rehabilitate a historic building to meet the Secretary of the Interior's Standards. "Retain" means that the building would not be completely demolished but the alterations may not meet the standards.
[c] Actual construction start date would be affected by PG&E's ongoing remediation process and market conditions, and construction would not start until all necessary permits are secured.



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

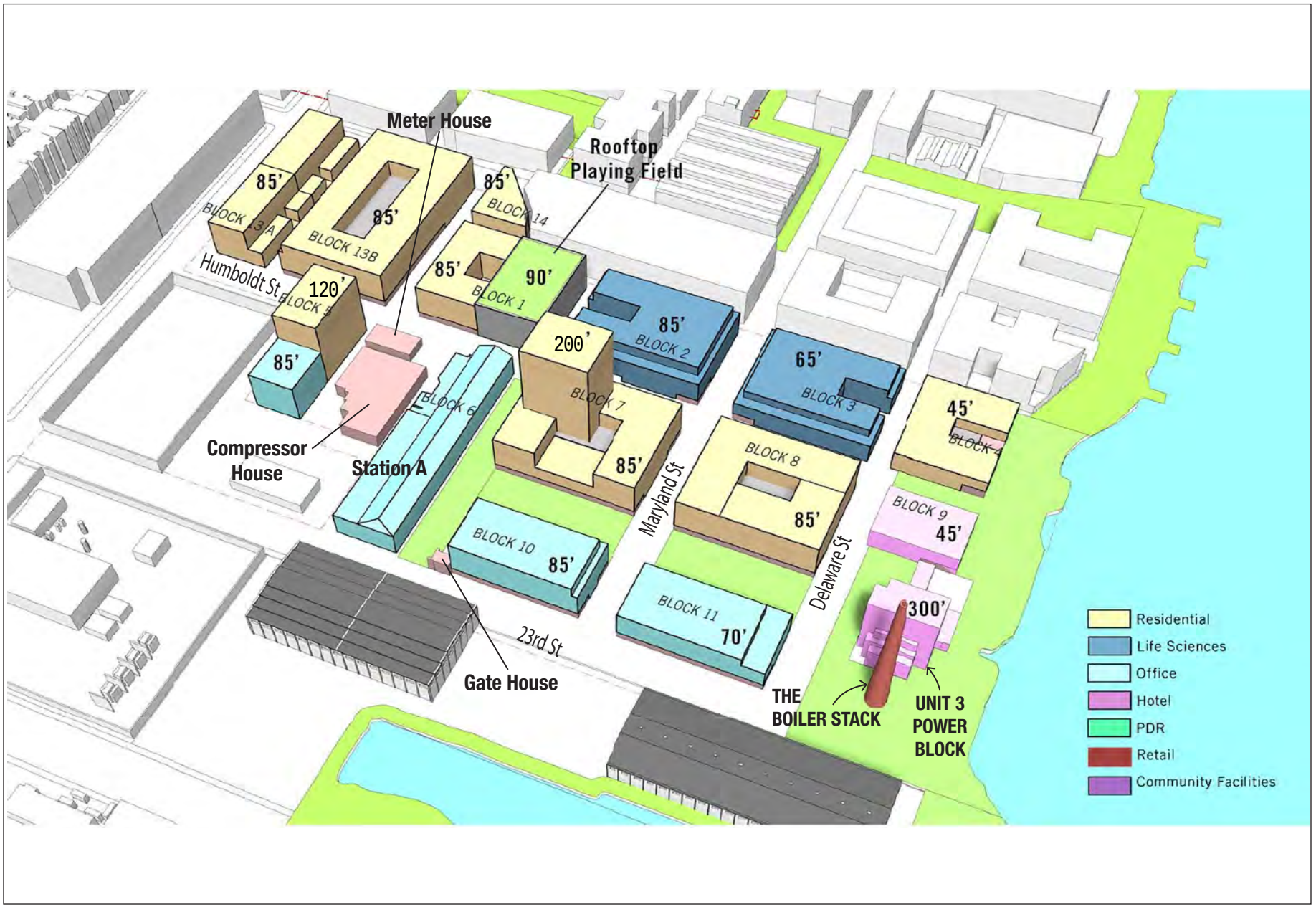
Figure 6-1
Proposed Project



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

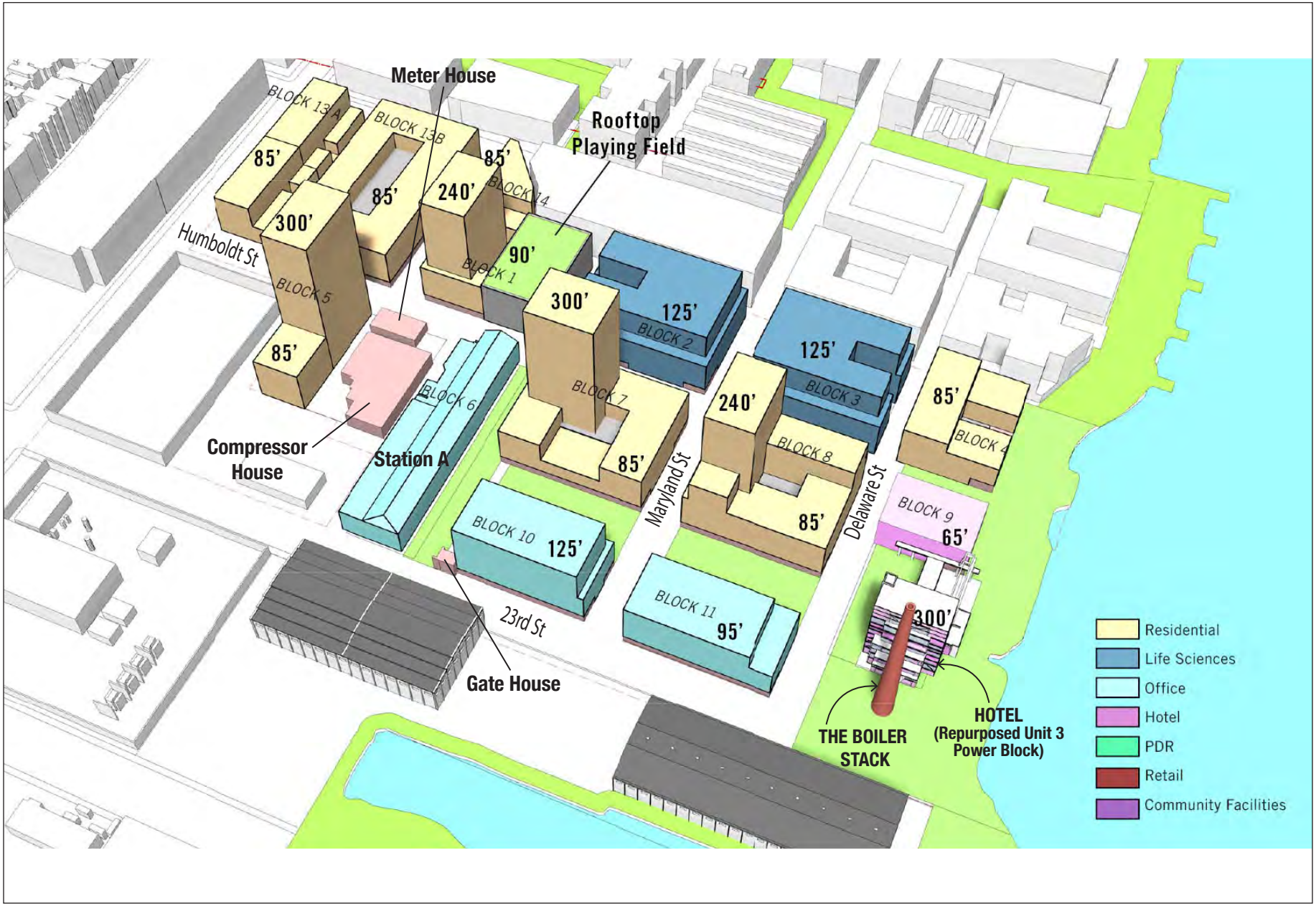
Figure 6-2
Alternative A: No Project/Code Compliant Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

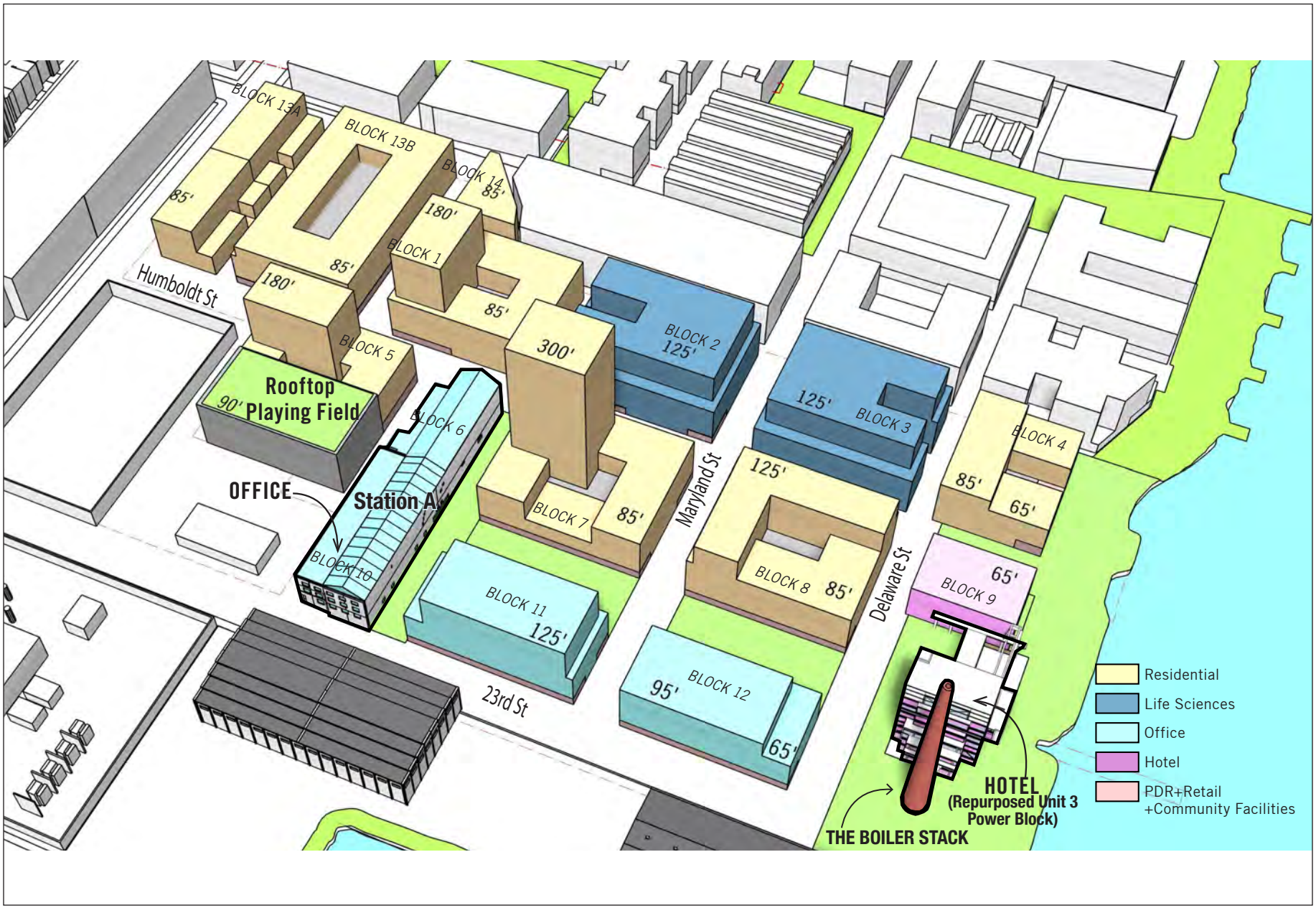
Figure 6-3
Alternative B: Full Preservation/Reduced Program Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

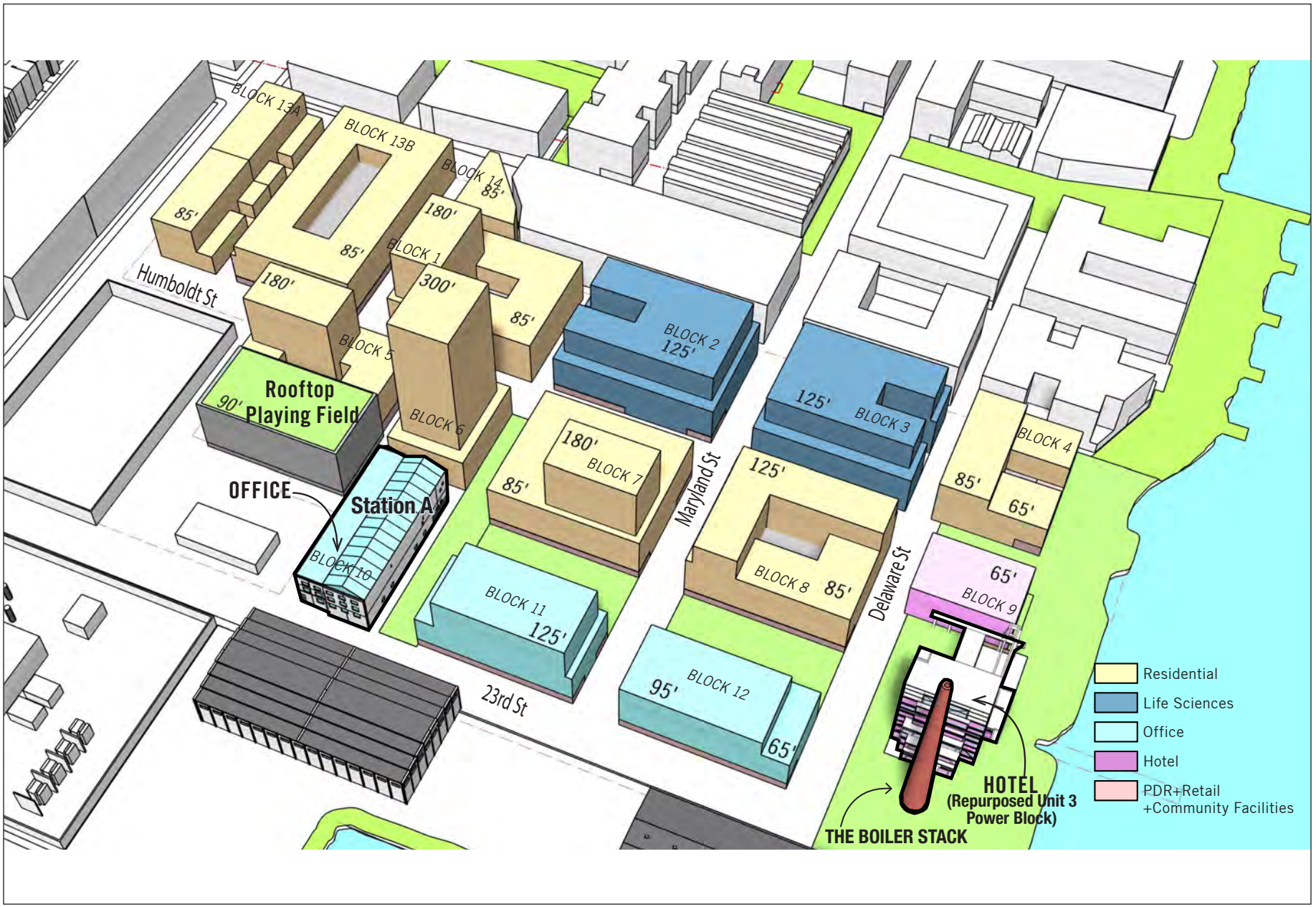
Figure 6-4
Alternative C: Full Preservation/Similar Program Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

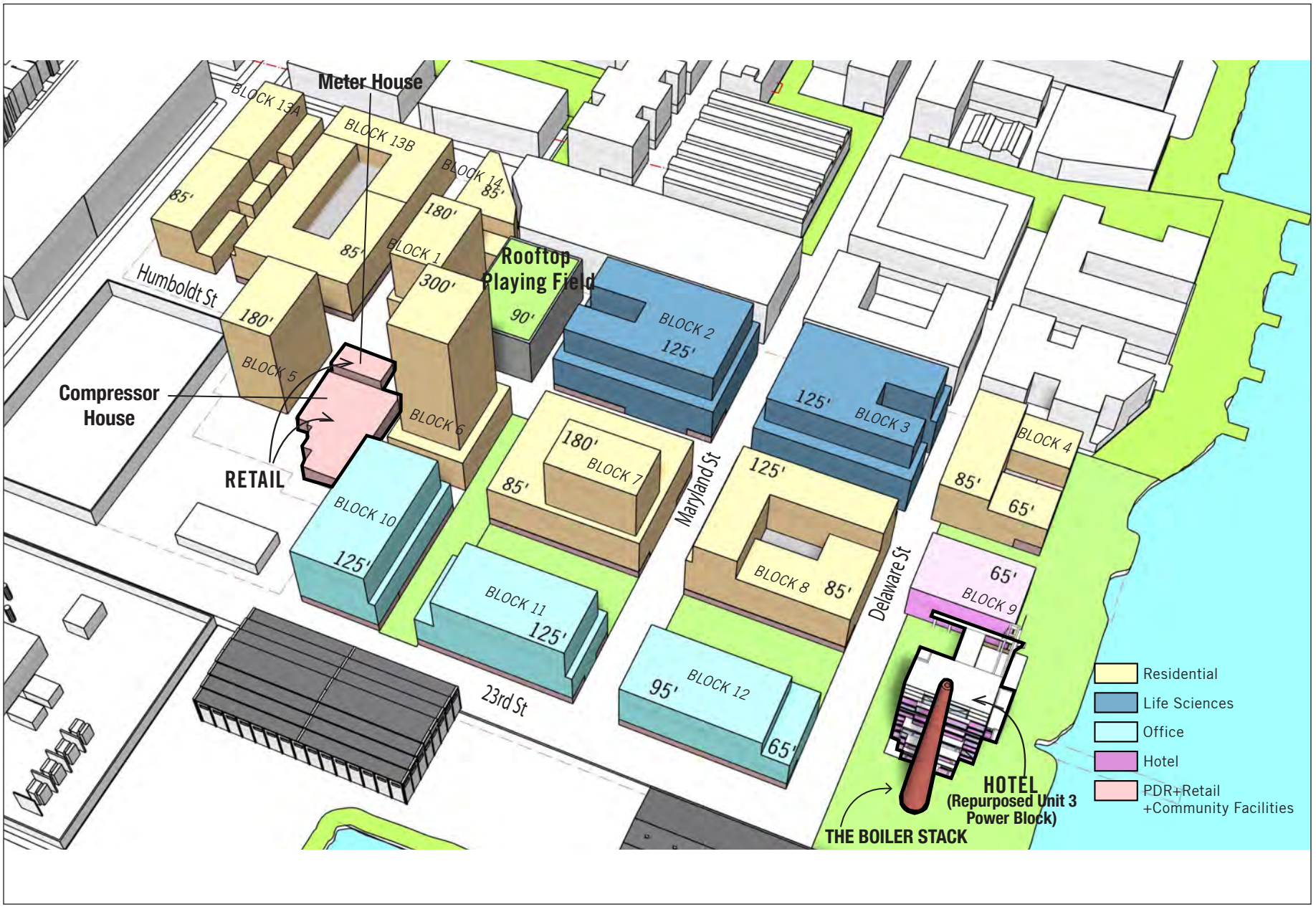
Figure 6-5
Alternative D: Partial Preservation 1 Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

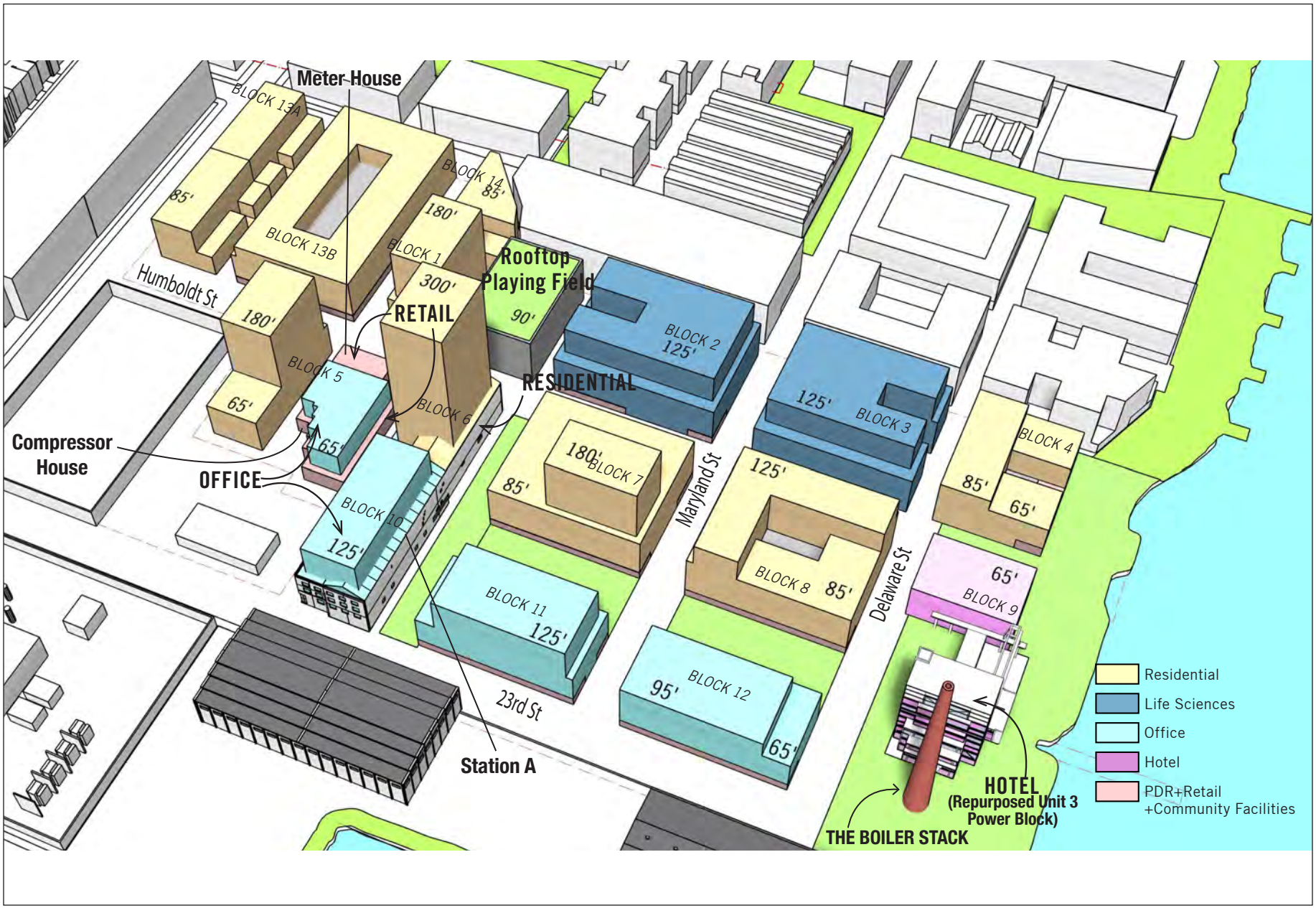
Figure 6-6
Alternative E: Partial Preservation 2 Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

Figure 6-7
Alternative F: Partial Preservation 3 Alternative



SOURCE: California Barrel Company, 2018

Potrero Power Station Mixed-Use Development Project

Figure 6-8
Alternative G: Partial Preservation 4 Alternative

TABLE 6-2
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objective	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
	Would the alternative meet this objective?						
1. Redevelop the former power plant site to provide a mix of residential, retail, office, PDR, R&D space, a hotel, and activated waterfront open spaces to support a daytime population in a vibrant neighborhood retail district and to provide employment opportunities within walking distance to residents of the surrounding neighborhood.	No (would provide some but not the full mix of uses)	Partial (compared to project, provides 66% residential, 66% retail, 75% office, 66% PDR, and 58% R&D)	Yes (compared to project, provides 100% residential, 100% retail, 91% office, 100% PDR, and 100% R&D)	Yes (compared to project, provides 91% residential, 100% retail, 92% office, 100% PDR, and 100% R&D)	Yes (compared to project, provides 100% residential, 100% retail, 82% office, 100% PDR, and 100% R&D)	Yes (compared to project, provides 92% residential, 100% retail, 100% office, 100% PDR, and 100% R&D)	Yes (compared to project, provides 93% residential, 100% retail, 99% office, 100% PDR, and 100% R&D)
2. Provide access to San Francisco Bay and create a pedestrian- and bicycle-friendly environment along the waterfront, by opening the eastern shore of the site to the public and extending the Bay Trail and the Blue Greenway.	Partial (compared to project, limited bicycle parking and extension of Bay Trail)	Yes	Yes	Yes	Yes	Yes	Yes
3. Provide active open space uses such as playing fields and a playground to improve access to sports, recreational, and playground facilities in the Dogpatch, Potrero Hill, and Bayview-Hunters Point neighborhoods and complement other nearby passive open space uses and parks in the Central Waterfront.	Partial (compared to project, provides 70% open space)	Yes	Yes	Yes	Yes	Yes	Yes
4. Increase the city's supply of housing to contribute to meeting San Francisco General Plan Housing Element goals, and the Association of Bay Area Governments' Regional Housing Needs Allocation for San Francisco by optimizing the number of dwelling units, particularly housing near transit.	No (compared to project, provides 0% residential)	Partial (compared to project, provides 66% residential)	Yes	Partial (compared to project, provides 91% residential)	Yes	Partial (compared to project, provides 92% residential)	Partial (compared to project, provides 93% residential)
5. Attract a diversity of household types by providing dense, mixed-income housing, including below-market rate units.	No	Yes	Yes	Yes	Yes	Yes	Yes
6. Redevelop the PG&E sub-area with community facilities, PDR, and housing.	No	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 6-2 (CONTINUED)
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objective	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
7. Build a neighborhood resilient to projected levels of sea level rise and earthquakes.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
8. Incorporate the project and the anticipated adjacent Pier 70 Mixed-Use District project into a single neighborhood, by creating a network of streets and pedestrian pathways that connect to the street and pedestrian network.	Partial	Partial (grade changes at Meter House and Compressor House would affect some connecting pathways)	Partial (grade changes at Meter House and Compressor House would affect some connecting pathways)	Yes	Yes	Partial (grade changes at Meter House / Compressor House would affect some connecting pathways)	Partial (grade changes at Meter House / Compressor House would affect some connecting pathways)
9. Create an iconic addition to the city's skyline as part of the Dogpatch neighborhood and the Central Waterfront.	No	Yes	Yes	Yes	Yes	Yes	Yes
10. Provide opportunities for outdoor dining and gathering and create an active waterfront in the evening hours by encouraging ground floor retail and restaurant uses with outdoor seating along the waterfront.	No	Yes	Yes	Yes	Yes	Yes	Yes
11. Build adequate parking and vehicular and loading access to serve the needs of project residents, workers, and visitors.	Yes (but no residents)	Yes	Yes	Yes	Yes	Yes	Yes
12. Construct a substantial increment of new PDR uses in order to provide a diverse array of commercial and industrial opportunities in a dynamic mixed use environment.	Partial (provides 2.4 times more PDR than project but not in a mixed use environment)	Partial (compared to project, provides 66% PDR uses)	Yes	Yes	Yes	Yes	Yes
13. Create a circulation and transportation system that emphasizes transit-oriented development and promotes the use of public transportation and car-sharing through an innovative and comprehensive demand management program.	No	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 6-2 (CONTINUED)
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objective	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
14. Demonstrate leadership in sustainable development by constructing improvements intended to reduce the neighborhood's per capita consumption of electricity, natural gas, and potable water, and generation of wastewater.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
15. Create a development that is financially feasible and that can fund the project's capital costs and on-going operation and maintenance costs relating to the redevelopment and long-term operation of the property.	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
16. Construct a waterfront hotel use in order to provide both daytime and nighttime activity on the waterfront promenade.	No	Yes	Yes	Yes	Yes	Yes	Yes

TABLE 6-3
PROPOSED PROJECT AND PROJECT ALTERNATIVES PERSON TRIP GENERATION BY TIME PERIOD – INTERNAL AND EXTERNAL TRIPS

Proposed Project/Project Alternative	Person Trips[a]		
	Daily	AM Peak Hour	PM Peak Hour
Proposed Project	93,609	6,665	11,218
No Project/Code Compliant Alternative	18,506	1,276	2,028
Reduced Program Alternative	62,364	4,411	7,418
Full Preservation Alternative	92,633	6,578	11,134
Partial Preservation 1 Alternative	90,749	6,303	10,796
Partial Preservation 2 Alternative	91,623	6,489	11,049
Partial Preservation 3 Alternative	91,702	6,394	10,888
Partial Preservation 4 Alternative	91,881	6,425	10,928

NOTES:
[a] Numbers may not sum to total due to rounding.

SOURCE: Technical Memorandum – Potrero Power Station Mixed-Use Development Project Estimation of Project Travel Demand, April 2018. See Appendix C.

6.C.1 Alternative A: No Project/Code Compliant

As required by CEQA Guidelines section 15126.6(e), a no project alternative is evaluated in this EIR to allow decision-makers to compare the environmental effects of approving the proposed project with the effects of not approving the project. The no project alternative is not intended to meet any of the project sponsor's objectives. The no project alternative is "the circumstance in which the project does not proceed." (CEQA Guidelines section 15126.6(e)(3)(B)). Due to the desirable location and the value of the land, the project sponsor (and owner of the Power Station sub-area) has indicated that if the project does not proceed, the project site would not remain in its current state of limited temporary uses and vacant buildings, but instead would be developed to the extent permitted by existing land use and planning code designations.

6.C.1.1 Alternative A: Land Use Plan

Alternative A is the No Project/Code Compliant Alternative, shown in Figure 6-2, above. This alternative assumes that the project sponsor would develop the Power Station sub-area in compliance with the existing planning code and land use designations. In addition, the adjoining Southern, City and eastern portions of the Port sub-areas of the project site (see Figure 2-2, p. 2-6, in Chapter 2, Project Description) would be developed in conjunction with the Power Station sub-area to provide continuity and connectivity to the bay and surrounding land uses; however, the 1.3 acre portion of the Port sub-area along 23rd Street would not be developed since it would not be germane to the development. However, due to the limited development potential under the existing zoning code and land use designations, this alternative assumes that the project sponsor would not seek to partner with PG&E in the development of the adjacent PG&E sub-area and that the 4.8-acre PG&E sub-area would remain in its current use as storage and housing for power transmission equipment. Thus, Alternative A would consist of development of a total of 22.9 acres compared to the 29 acres under the proposed project.

TABLE 6-4
PROPOSED PROJECT AND PROJECT ALTERNATIVES TRIP GENERATION BY MODE AND TIME PERIOD – EXTERNAL TRIPS ONLY[a,b]

Proposed Project/Project Alternative	Person Trips by Travel Mode				Vehicle Trips
	Auto	Transit	Other[c]	Total	
Daily					
Proposed Project	33,495	15,969	18,351	67,814	19,522
No Project/Code Compliant Alternative	11,661	2,976	3,868	18,506	6,635
Reduced Program Alternative	22,405	10,698	12,261	45,363	13,045
Full Preservation Alternative	33,017	15,704	18,122	66,844	19,256
Partial Preservation 1 Alternative	32,802	15,422	18,212	66,435	18,938
Partial Preservation 2 Alternative	32,415	15,416	17,808	65,639	18,931
Partial Preservation 3 Alternative	33,227	15,666	18,403	67,296	19,182
Partial Preservation 4 Alternative	33,216	15,683	18,371	67,270	19,205
AM Peak Hour					
Proposed Project	2,472	1,796	871	5,139	1,862
No Project/Code Compliant Alternative	846	247	183	1,276	578
Reduced Program Alternative	1,638	1,189	577	3,404	1,233
Full Preservation Alternative	2,426	1,767	860	5,052	1,830
Partial Preservation 1 Alternative	2,357	1,695	833	4,884	1,762
Partial Preservation 2 Alternative	2,379	1,738	849	4,965	1,799
Partial Preservation 3 Alternative	2,400	1,724	844	4,968	1,793
Partial Preservation 4 Alternative	2,406	1,732	847	4,985	1,800
PM Peak Hour					
Proposed Project	3,835	2,223	1,764	7,823	2,540
No Project/Code Compliant Alternative	1,329	337	362	2,028	837
Reduced Program Alternative	2,540	1,472	1,167	5,179	1,682
Full Preservation Alternative	3,791	2,195	1,753	7,740	2,509
Partial Preservation 1 Alternative	3,732	2,131	1,738	7,601	2,447
Partial Preservation 2 Alternative	3,746	2,167	1,743	7,656	2,479
Partial Preservation 3 Alternative	3,773	2,159	1,748	7,680	2,476
Partial Preservation 4 Alternative	3,778	2,166	1,749	7,693	2,482

NOTES
[a] Numbers may not sum to total due to rounding.
[b] External trips are those whose origin or destination is outside the project site.
[c] Other modes include walk, bicycle, motorcycle, and additional modes such as taxis.

SOURCE: Technical Memorandum – Potrero Power Station Mixed-Use Development Project Estimation of Project Travel Demand, April 2018. See Appendix C.

Currently, the Power Station sub-area is zoned M-2 (Heavy Industrial) and located in a 40-X Height and Bulk District. Thus, under the No Project/Code Compliant Alternative, the project site would be developed with 87,655 gross square feet (gsf) of commercial uses (general office; 510,068 gsf less than the project), 1,088,735 gsf of Production, Distribution, and Repair (PDR) uses (1,043,695 gsf more than the project), and 20,768 gsf of retail uses (86,671 gsf less than the project). The retail uses would be comprised of 3,131 gsf of general retail, 7,054 gsf of sit-down restaurant, and 10,583 gsf of quick service restaurant. There would be no residential uses (including no childcare uses), and no commercial uses designated for R&D/life sciences uses, since these uses are not be allowed under the existing zoning. There would be 274,400 gsf of parking (647,581 gsf less than the project), providing 784 parking spaces (1,838 fewer than the project), but no centralized parking facility would be developed. Total building area would be 1,471,558 gsf, as compared with 5,367,860 gsf for the proposed project (about 28 percent of the proposed project's total building area. All buildings would be 40 feet in height, consistent with the existing height limit.

This alternative would include 4.4 acres of open space (1.9 acres less than the project), including a rooftop playing field on one of the commercial buildings. Similar to the project, this alternative is assumed to extend the Blue Greenway and Bay Trail through the project site. However, there would be no dock or associated wharf and gangway along the bay shoreline. The overall land use plan, with the exception of the retention of the Boiler Stack, would be completely different from that of the proposed project, as shown in Figure 6-2.

6.C.1.2 Alternative A: Historical Resources and Transportation Features

The No Project/Code Compliant Alternative assumes that Station A, the Compressor House, the Gate House, the Meter House, and the Unit 3 Power Block would be demolished to enable the redevelopment of the site with new, code compliant land uses. This alternative assumes that the Boiler Stack would be retained and repurposed for retail uses, though not necessarily rehabilitated in accordance with the Secretary of Interior's Standards.

Under this alternative, the interior street network would connect with the planned street network on the Pier 70 Mixed-Used District project site (directly to the north of the project site), but not in the same way as the proposed project. Unlike the proposed project, there would be no provisions for a future Muni bus stop on 23rd Street, sidewalk improvements on Illinois Street, or a new traffic signal at Illinois/Humboldt, none of which would be warranted based on the small size of the increase in onsite population; however, a new traffic signal may be warranted at Illinois/23rd. Likewise, the No Project/Code Compliant Alternative would not necessarily include a transit shuttle service. This alternative, however, would comply with the Transportation Demand Management (TDM) Ordinance, which requires new development projects meeting the applicability requirement to develop and implement a TDM plan.

6.C.1.3 Alternative A: Travel Demand Assumptions

As indicated in Table 6-3 above, the number of total person trips (i.e., both internal and external) generated by Alternative A would be substantially less than with the proposed project. On a daily basis, Alternative A would generate a total of 18,506 person trips by all modes, compared to

93,609 person trips for the proposed project (i.e., 75,103 fewer person trips). Similarly, as indicated in Table 6-4 above, the number of *external* person trips and vehicle trips generated by Alternative A on a daily basis and during the a.m. and p.m. peak hours would also be substantially less than with the proposed project. During the a.m. peak hour, Alternative A would generate 1,276 external person trips by all modes and 578 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 3,863 fewer person trips and 1,284 fewer vehicle trips). During the p.m. peak hour, Alternative A would generate 2,028 external person trips by all modes and 837 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 5,795 fewer person trips and 1,703 fewer vehicle trips).

6.C.1.4 Alternative A: Construction

Construction of Alternative A would be similar to the proposed project, though substantially reduced in both magnitude and duration. With the reduced size of the buildings, deep foundations might not be needed, in which case less pile driving would occur. No in-water construction would occur. It is anticipated that construction would take less than half the time as the project, starting in 2020 and completed in 2026, a seven-year construction duration compared to the 15-year duration for the proposed project. Only three construction phases, rather than six, would be needed. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions, and construction would not start until all necessary permits are secured. Since this alternative includes only commercial/industrial uses, no additional remediation efforts would be required beyond those currently be completed by PG&E.

6.C.2 Alternative B: Full Preservation/Reduced Program

Alternative B is the Full Preservation/Reduced Program Alternative, shown in Figure 6-3, above. The purpose of this alternative is to avoid or substantially reduce the significant and unavoidable impacts on historic architectural resources, both to individual resources and to the historic district, as well as to substantially reduce the severity of significant, adverse transportation, noise, and air quality impacts that would occur under the proposed project.

6.C.2.1 Alternative B: Land Use Plan

The Full Preservation/Reduced Program Alternative would retain and rehabilitate in accordance with the Secretary of Interior's Standards all six onsite historic structures: Station A, the Meter House, the Compressor House, the Gate House, the Unit 3 Power Block, and the Boiler Stack. Building floors would be added to the open volume interior space of Station A. This alternative would incorporate these structures into a development reduced in all aspects to about two thirds the size of the proposed project, thereby reducing the magnitude of both construction and operational impacts, but still retaining the diversity of land uses under the proposed project.

The general site plan for Alternative B would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street (including the rehabilitated Station A and Gate House); residential uses would be generally located in the

northwest, central, and northeast portions of the site and within the tower and tallest buildings; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and the hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The parking garage and rooftop playing field, however, would be on the north side of the site, rather than in the center part of the site, due to the retention of the Meter House and Compressor House.

Under Alternative B, it is assumed that the site would be developed with 1,764,202 gsf of residential uses (1,764 dwelling units, 918 fewer than the project), 160,290 gsf of hotel uses (145 rooms, 75 fewer than the project), 450,362 gsf of commercial uses (general office; 147,361 gsf less than the project), 373,747 gsf of commercial uses (R&D; 271,991 gsf less than the project), 29,726 gsf of PDR uses (15,314 gsf less than the project), and 70,910 gsf of retail uses (36,529 gsf less than the project). The retail uses would be comprised of 7,091 gsf of general retail, 28,364 gsf of supermarket use, 10,636 gsf of sit-down restaurant, and 24,818 gsf of quick service restaurant. The Full Preservation/Reduced Program Alternative would also include 66,619 gsf of community facilities (e.g., childcare, media library, or community center; 34,319 gsf less than the project) and 16,500 gsf of entertainment/assembly uses (8,500 gsf less than the project). There would also be 634,032 gsf of parking (287,949 gsf less than the project), providing 1,729 parking spaces (893 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 3,566,388 gsf, less than the amount of development in the proposed project (5,367,860 gsf or about 66 percent of the proposed project). Buildings heights would generally be reduced compared to the proposed project, ranging from 45 to 120 feet instead of 65 to 180 feet, and the 300-foot tower on Block 6 would be replaced by a 200-foot-tall tower at Block 7. Two of the three 180-foot-tall buildings on Blocks 1 and 7 would be eliminated, and the 180-foot-tall building on Block 5 would be replaced by a 120-foot-tall building.

Alternative B, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.2.2 Alternative B: Historical Resources and Transportation Features

With respect to historical resources, this alternative would retain the exterior character-defining features of all individually eligible historical resources and the majority of the Third Street Industrial District contributing structures. The historic buildings would be rehabilitated in accordance with the Secretary of the Interior's Standards. Station A would be used as office space, while the Meter House, Compressor House, and Gate House would be used for retail. Unlike the proposed project under which the Unit 3 Power Block would be retained or demolished, the Unit 3 Power Block would be retained, rehabilitated in accordance with the Secretary of the Interior's Standards, and converted to a hotel, even if the reuse of the structure were more limited than under the proposed project. Like the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could

also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative B would be similar to the proposed project and would connect with the planned street network on the Pier 70 Mixed-Used District site directly to the north of the project site; however, Georgia Lane, on the west side of Station A, would not be constructed. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan that includes a transit shuttle service as described for the proposed project.

6.C.2.3 Alternative B: Travel Demand Assumptions

On a daily basis, Alternative B would generate a total of 62,364 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 31,245 fewer person trips). The number of external person trips and vehicle trips generated by Alternative B would also be less than with the proposed project. During the a.m. peak hour, Alternative B would generate 3,404 external person trips by all modes and 1,233 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 1,735 fewer person trips and 629 fewer vehicle trips). During the p.m. peak hour, Alternative B would generate 5,179 external person trips by all modes and 1,682 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 2,644 fewer person trips and 858 fewer vehicle trips).

6.C.2.4 Alternative B: Construction

Construction of Alternative B would be similar to the proposed project, though somewhat reduced in magnitude and duration due to the reduced program, but construction activities associated with rehabilitation of the historical structures would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. However, construction of Alternative B would take four years less than the proposed project. It is anticipated that construction would start in 2020 and be completed in 2030, an 11-year construction duration compared to the 15-year duration for the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates could be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, under this alternative, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.C.3 Alternative C: Full Preservation/Similar Program

Alternative C is the Full Preservation/Similar Program Alternative, shown in Figure 6-4, above. The purpose of this alternative is to avoid or substantially reduce the significant and unavoidable impacts on historic architectural resources that would occur under the proposed project, while retaining nearly the same number of residential units as the proposed project. This alternative was designed to meet the basic project objectives and a majority of all the objectives.

6.C.3.1 Alternative C: Land Use Plan

As indicated by the name, the Full Preservation/ Similar Program Alternative would retain and rehabilitate in accordance with the Secretary of Interior's Standards all six onsite historic structures: Station A, the Meter House, the Compressor House, the Gate House, the Unit 3 Power Block, and the Boiler Stack. Building floors would be added to the open volume interior space of Station A. This alternative would incorporate these structures into a development program similar in magnitude to the proposed project, and would specifically include about the same number of residential units as the project.

The general site plan for Alternative C would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street (including within the rehabilitated Station A and Gate House); residential uses would be generally located in the northwest, central, and northeast portions of the site and within the tallest buildings, including the two 300-foot towers and; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The district parking garage and rooftop playing field, however, would be on the north side of the site, rather than in the center of the site.

Under Alternative C, it is assumed that the site would be developed with 2,681,272 gsf of residential uses (2,681 dwelling units, essentially the same as the project), 241,574 gsf of hotel uses (220 rooms, same as the project), 544,228 gsf of commercial uses (general office, 53,495 gsf less than the project), 645,738 gsf of commercial uses (R&D, same as the project), 45,040 gsf of PDR uses (same as the project), and 107,439 gsf of retail uses (same as the project). As under the proposed project, the retail uses would be comprised of 10,744 gsf of general retail, 42,976 gsf of supermarket use, 16,116 gsf of sit-down restaurant, and 37,604 gsf of quick service restaurant. The Full Preservation/ Similar Program Alternative would also include 100,938 gsf of community facilities (e.g., childcare, media library, or community center; same as the project) and 25,000 gsf of entertainment/assembly uses (same as the project). There would also be 905,226 gsf of parking (16,755 gsf less than the project), providing 2,585 parking spaces (37 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 5,296,455 gsf, which is a slight reduction in the magnitude of the development compared to the proposed project (5,367,860 gsf or about 99 percent of the proposed project). Buildings heights would generally be the same as those identified for proposed project, ranging from 65 to 180 feet, but the 300-foot tower on Block 6 would be moved to Block 7, in order to retain all of Station A. In addition, unlike the proposed project which has three 180-foot

buildings on Blocks 1, 5, and 7, to allow for additional residential units, this alternative would have a second 300-foot tower on Block 5 and two 240-foot towers on Blocks 1 and 8.

Alternative C, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.3.2 Alternative C: Historical Resources and Transportation Features

With respect to historical resources, like the other full preservation alternative, Alternative C would retain the exterior character-defining features of all six onsite historical resources, and the historic buildings would be rehabilitated in accordance with the Secretary of the Interior's Standards. Station A would be used as office space, while the Meter House, Compressor House, and Gate House would be used for retail. Unlike the proposed project under which the Unit 3 Power Block would be retained or demolished, the Unit 3 Power Block would be retained, rehabilitated in accordance with the Secretary of the Interior's Standards, and converted to a hotel, even if the reuse of the structure were more limited than under the proposed project. Like the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space, but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative C would be similar to the proposed project and would connect with the planned street network on the Pier 70 Mixed-Used District site directly to the north of the project site; however, Georgia Lane between Block 5 and Blocks 6 and 10 would not be constructed because of grade changes that would have to be maintained to rehabilitate the Meter House and Compressor House. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan and a transit shuttle service as described for the proposed project.

6.C.3.3 Alternative C: Travel Demand Assumptions

On a daily basis, Alternative C would generate a total of 92,633 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 976 fewer person trips). The number of external person trips and vehicle trips generated by Alternative C would also be very similar to the proposed project. During the a.m. peak hour, Alternative C would generate 5,052 external person trips by all modes and 1,830 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 87 fewer person trips and 32 fewer vehicle trips). During the p.m. peak hour, Alternative C would generate 7,740 external person trips by all modes and 2,509 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 83 fewer person trips and 31 fewer vehicle trips).

6.C.3.4 Alternative C: Construction

Construction of Alternative C would be similar to the proposed project, both in magnitude and duration, but construction activities associated with rehabilitation of the historical structures would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. Construction of Alternative C would take about the same amount of time as the proposed project. It is anticipated that construction would start in 2020 and be completed in 2036, the same 15-year construction duration as the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.C.4 Alternative D: Partial Preservation 1

Alternative D is the Partial Preservation 1 Alternative, shown in Figure 6-5, above. The purpose of this alternative is to substantially lessen the significant impacts on historic architectural resources to both individual resources and the historic district that would occur under the proposed project, while still meeting most of the project objectives. The partial preservation alternatives aim to retain in full or in part the character-defining features of one or more of the identified individual resources and, at the same time, reduce impacts to the historic district. This alternative was designed to meet the basic project objectives and a majority of all the objectives.

6.C.4.1 Alternative D: Land Use Plan

Alternative D would retain Station A and rehabilitate its exterior character-defining features in accordance with the Secretary of Interior's Standards. Building floors would be added to the open volume interior space of Station A. This alternative would incorporate a development program similar in magnitude to the proposed project. Three historic structures—the Meter House, the Compressor House, and the Gate House—would be demolished. The major changes from the proposed project would be that Station A would exist in place of a 125-foot building on Block 10, and the 300-foot tower on Block 6 would be relocated to Block 7. Similar to the proposed project, Alternative D would retain the Unit 3 Power Block for hotel use. Also as with the project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

The general site plan for Alternative D would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street (including the rehabilitated Station A); residential uses would be generally located in the northwest, central, and northeast portions of the site and within the tallest buildings including the 300-foot tower; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and the hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The parking garage with rooftop playing field would be in the same location as under the proposed project.

Under the Alternative D, it is assumed that the site would be developed with 2,444,690 gsf of residential uses (2,445 dwelling units, 237 fewer units than the project), 241,574 gsf of hotel uses (220 rooms, same as the project), 551,694 gsf of commercial uses (general office, 46,029 gsf less than the project), 645,738 gsf of R&D uses (same as the project), 45,040 gsf of PDR uses (same as the project), and 107,439 gsf of retail uses (same as the project). As under the proposed project, the retail uses would be comprised of 10,744 gsf of general retail, 42,976 gsf of supermarket use, 16,116 gsf of sit-down restaurant, and 37,604 gsf of quick service restaurant. The Partial Preservation 1 Alternative would also include 100,938 gsf of community facilities (e.g., childcare, media library, or community center; same as the project) and 25,000 gsf of entertainment/assembly uses (same as the project). There would also be 857,276 gsf of parking (64,705 gsf less than the project), providing 2,409 parking spaces (213 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 5,019,389 gsf, which is a slight reduction in the magnitude of the development program compared to the proposed project (5,367,860 gsf or about 94 percent of the proposed project). Buildings heights would generally be the same as those identified for the proposed project, ranging from 65 to 180 feet, with a 300-foot tower on Block 7. In addition, unlike the proposed project which has three 180-foot buildings on Blocks 1, 5, and 7, this alternative would have only two 180-foot buildings on Blocks 1 and 5.

Alternative D, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.4.2 Alternative D: Historical Resources and Transportation Features

With respect to historical resources, Alternative D would retain Station A and rehabilitate its exterior character-defining features in accordance with the Secretary of the Interior's Standards. Station A would be used as office space. The Meter House, the Compressor House, and the Gate House would be demolished. The Unit 3 Power Block would be retained and converted to a hotel. Similar to the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space, but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative D would be similar to the proposed project and would connect with the planned street network on the Pier 70 Mixed-Used District site directly to the north of the project site; however, Georgia Lane between Block 5 and Blocks 6 and 10 would not be constructed because of grade changes that would have to be maintained to rehabilitate the Meter House and Compressor House. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan and a transit shuttle service as described for the proposed project.

6.C.4.3 Alternative D: Travel Demand Assumptions

On a daily basis, Alternative D would generate a total of 90,749 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 2,860 fewer person trips). The number of external person trips and vehicle trips generated by Alternative D would be similar to the proposed project. During the a.m. peak hour, Alternative D would generate 4,884 external person trips by all modes and 1,762 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 255 fewer person trips and 100 fewer vehicle trips). During the p.m. peak hour, Alternative D would generate 7,601 external person trips by all modes and 2,447 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 222 fewer person trips and 93 fewer vehicle trips).

6.C.4.4 Alternative D: Construction

Construction of Alternative D would be similar to the proposed project, both in magnitude and duration, but construction activities associated with rehabilitation of Station A would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. Construction of Alternative D would take about the same amount of time as the proposed project. It is anticipated that construction would start in 2020 and be completed in 2036, the same 15-year construction duration as the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.C.5 Alternative E: Partial Preservation 2

Alternative E is the Partial Preservation 2 Alternative, shown in Figure 6-6, above. The purpose of this alternative is to substantially lessen the significant impacts on historic architectural resources to both individual resources and the historic district that would occur under the proposed project, while still meeting most of the project objectives. The partial preservation alternatives aim to retain in full or in part the character-defining features of one or more of the identified individual resources and at the same time reduce impacts to the historic district. This alternative was designed to meet the basic project objectives and a majority of all the objectives.

6.C.5.1 Alternative E: Land Use Plan

Alternative E would retain the southern portion of Station A and rehabilitate all or a portion of the exterior character-defining features of the remaining portion of the structure in accordance with the Secretary of Interior's Standards to the extent feasible. Building floors would be added to the open volume interior space of the remaining portion of Station A. The southern portion of Station A was selected because there are more character-defining features at that end, and it would replace a 125-foot-tall office building in the same location under the proposed project. Otherwise, this alternative generally follows the same land use mixes, heights, and configurations as the proposed project, including demolition of the Meter House, the Compressor House, the Gate House, and northern portion of Station A. Similar to the proposed project, Alternative E would retain the Unit 3 Power Block for hotel use. Also as with the project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

The general site plan for Alternative E would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street (including the rehabilitated southern portion of Station A); residential uses would be generally located in the northwest, central, and northeast portions of the site within the tallest buildings, including the 300-foot tower; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and a hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The district parking garage with rooftop playing field would be in the same location as with the proposed project.

Under Alternative E, it is assumed that the site would be developed with 2,682,427 gsf of residential uses (2,682 dwelling units, same as the proposed project), 241,574 gsf of hotel uses (220 rooms, same as the project), 488,012 gsf of commercial uses (general office, 109,711 gsf less than the project), 645,738 gsf of commercial uses (R&D, same as the project), 45,040 gsf of PDR uses (same as the project), and 107,439 gsf of retail uses (same as the project). As under the proposed project, the retail uses would be comprised of 10,744 gsf of general retail, 42,976 gsf of supermarket use, 16,116 gsf of sit-down restaurant, and 37,604 gsf of quick service restaurant. The Partial Preservation 2 Alternative would also include 100,938 gsf of community facilities (e.g., childcare, media library, or community center; same as the project) and 25,000 gsf of entertainment/assembly uses (same as the

project). There would also be 892,276 gsf of parking (29,705 gsf less than the project), providing 2,549 parking spaces (73 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 5,228,444 gsf, which is a slight reduction in the magnitude of the development program compared to the proposed project (5,367,860 gsf or about 97 percent of the proposed project). With the exception of the southern portion of Station A replacing a 125-foot-building on Block 10, the buildings heights would otherwise be the same as those identified for the proposed project, ranging from 65 to 180 feet, with a 300-foot tower on Block 6 and three 180-foot-tall buildings on Blocks 1, 5, and 7.

Alternative E, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.5.2 Alternative E: Historical Resources and Transportation Features

With respect to historical resources, Alternative E would retain the southern portion of Station A and rehabilitate the exterior character-defining features of the remaining portion of the building in accordance with the Secretary of the Interior's Standards to the extent feasible. Building floors would be added to the open volume interior space of Station A. Station A would be used as office space. The Meter House, the Compressor House, and the Gate House would be demolished. The Unit 3 Power Block would be retained and converted to a hotel. Similar to the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space, but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative E would be identical to that of the proposed project and would connect with the planned street network on the Pier 70 Mixed-Used District site directly to the north of the project site. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan and a transit shuttle service as described for the proposed project.

6.C.5.3 Alternative E: Travel Demand Assumptions

On a daily basis, Alternative E would generate a total of 91,623 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 1,986 fewer person trips). The number of external person trips and vehicle trips generated by Alternative E would be similar to the proposed project. During the a.m. peak hour, Alternative E would generate 4,965 external person trips by all modes and 1,799 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 174 fewer person trips and 63 fewer vehicle trips). During the p.m. peak hour, Alternative E would generate 7,656 external person trips by all modes and 2,479

external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 167 fewer person trips and 61 fewer vehicle trips).

6.C.5.4 Alternative E: Construction

Construction of Alternative E would be similar to the proposed project, both in magnitude and duration, but construction activities associated with rehabilitation of the southern portion of Station A would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. Construction of Alternative E would take about the same amount of time as the proposed project. It is anticipated that construction would start in 2020 and be completed in 2036, the same 15-year construction duration as the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.C.6 Alternative F: Partial Preservation 3

Alternative F is the Partial Preservation 3 Alternative, shown in Figure 6-7, above. The purpose of this alternative is to substantially lessen the significant impacts on historic architectural resources to both individual resources and the historic district that would occur under the proposed project, while still meeting most of the project objectives. The partial preservation alternatives aim to retain in full or in part the character-defining features of one or more of the identified individual resources and at the same time reduce impacts to the historic district. This alternative was designed to meet the basic project objectives and a majority of all the objectives.

6.C.6.1 Alternative F: Land Use Plan

Alternative F would retain the Compressor House and the Meter House and rehabilitate all or a portion of their exterior character-defining features in accordance with the Secretary of Interior's Standards. This alternative would incorporate these structures into a development program similar in magnitude to the proposed project. Two historic structures—Station A and the Gate House—would be demolished. The major change from the proposed project would be that the parking garage with rooftop playing field would be relocated from Block 5 to Block 1, with an associated reduction in the building area of the garage and residential uses that are proposed on these blocks under the project. Similar to the proposed project, Alternative F would retain the Unit 3 Power Block for a hotel use. Also as with the project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

The general site plan for Alternative F would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street: residential uses would be generally located in the northwest, central, and northeast portions of the site, within the tallest buildings including the 300-foot tower; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and the hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The parking garage and rooftop playing field would be on the north side of the site, rather than in the center part of the site.

Under Alternative F, it is assumed that the site would be developed with 2,458,595 gsf of residential uses (2,459 dwelling units, 223 fewer units than the project), 241,574 gsf of hotel uses (220 rooms, same as the project), 597,723 gsf of commercial uses (general office, same as the project), 645,738 gsf of commercial uses (R&D, same as the project), 45,040 gsf of PDR uses (same as the project), and 107,439 gsf of retail uses (same as the project). As under the proposed project, the retail uses would be comprised of 10,744 gsf of general retail, 42,976 gsf of supermarket use, 16,116 gsf of sit-down restaurant, and 37,604 gsf of quick service restaurant. Partial Preservation 3 Alternative would also include 100,938 gsf of community facilities (e.g., childcare, media library, or community center; same as the project) and 25,000 gsf of entertainment/uses (same as the project). There would also be 870,717 gsf of parking (51,264 gsf less than the project), providing 2,487 parking spaces (135 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 5,092,764 gsf, which is a slight reduction in the magnitude of the development program compared to the proposed project (5,367,860 gsf or about 95 percent of the proposed project). Buildings heights would generally be the same as those identified for proposed project, ranging from 65 to 180 feet, with a 300-foot tower on Block 6. In addition, similar to the proposed project, there would be three 180-foot buildings on Blocks 1, 5, and 7.

Alternative F, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.6.2 Alternative F: Historical Resources and Transportation Features

With respect to historical resources, Alternative F would retain the Compressor House and Meter House and rehabilitate all or a portion of their exterior character-defining features in accordance with the Secretary of the Interior's Standards. The Compressor House and the Meter House would be converted to retail uses. Station A and the Gate House would be demolished. The Unit 3 Power Block would be retained and converted to a hotel. Similar to the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative F would be similar to the proposed project and would connect with the planned street network in the Pier 70

Mixed-Used District site directly to the north of the project site; however, Georgia Lane, on the east side of the Compressor House and Meter House, would be narrower, with sidewalks only on one side of the lane. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan and a transit shuttle service as described for the proposed project.

6.C.6.3 Alternative F: Travel Demand Assumptions

On a daily basis, Alternative F would generate a total of 91,702 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 1,907 fewer person trips). The number of external person trips and vehicle trips generated by Alternative F would be similar to the proposed project. During the a.m. peak hour, Alternative F would generate 4,968 external person trips by all modes and 1,793 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 171 fewer person trips and 69 fewer vehicle trips). During the p.m. peak hour, Alternative F would generate 7,680 external person trips by all modes and 2,476 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 143 fewer person trips and 64 fewer vehicle trips).

6.C.6.4 Alternative F: Construction

Construction of Alternative F would be similar to the proposed project, both in magnitude and duration, but construction activities associated with rehabilitation of the Compressor House and Meter House would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. Construction of Alternative F would take about the same amount of time as the proposed project. It is anticipated that construction would start in 2020 and be completed in 2036, the same 15-year construction duration as the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.C.7 Alternative G: Partial Preservation 4

Alternative G is the Partial Preservation 4 Alternative, shown in Figure 6-8, above. The purpose of this alternative is to substantially lessen the significant impacts on historic architectural

resources to both individual resources and the historic district that would occur under the proposed project, while still meeting most of the project objectives. The partial preservation alternatives aim to retain in full or in part the character-defining features of one or more of the identified individual resources and at the same time reduce impacts to the historic district. This alternative was designed to meet the basic project objectives and a majority of all the objectives.

6.C.7.1 Alternative G: Land Use Plan

Alternative G would retain the façades and exterior character-defining features of Station A, the Compressor House, and the Meter House, but would include new construction within and above these buildings. A 125-foot-tall office building would extend from within the façades of the southern portion of Station A, and a 300-foot-tall residential tower would rise from within the façades of the northern portion of Station A. The ground floors within the façades of the Compressor House and Meter House would be used for retail, with new construction extending 65 feet above the Compressor House to be used for office space. The alternative would incorporate these structures into a development similar in magnitude to the proposed project. One historic structure—the Gate House—would be demolished. The major changes from the proposed project would be: (1) the parking garage with rooftop playing field would be relocated from Block 5 to Block 1, with an associated reduction in the building area of the garage and residential uses that are proposed on these blocks under the project, and (2) the 65-foot and 180-foot residential buildings adjacent to the Compressor House and Meter House would be redesigned. Similar to the proposed project, Alternative G would retain the Unit 3 Power Block for a hotel use. Also as with the project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

The general site plan for Alternative G would remain similar to that of the proposed project: office uses would be located on the south side of the site along 23rd Street (including the new construction within the façades of Station A and the Compressor House); residential uses would be generally located in the northwest, central, and northeast portions of the site within the tallest buildings including the 300-foot tower within the façade of the northern portion of Station A; R&D/life sciences uses would be located on the north side of the site, abutting the Pier 70 development to the north; and hotel use would be along the bay shoreline, within and adjacent to the Unit 3 Power Block. The parking garage and rooftop playing field would be on the north side of the site, rather than in the center part of the site.

Under the Alternative G, it is assumed that the site would be developed with 2,491,852 gsf of residential uses (2,492 dwelling units, 190 fewer units than the project), 241,574 gsf of hotel uses (220 rooms, same as the project), 592,018 gsf of commercial uses (general office, 5,705 gsf less than the project), 645,738 gsf of commercial uses (R&D, same as the project), 45,040 gsf of PDR uses (same as the project), and 107,439 gsf of retail uses (same as the project). As under the proposed project, the retail uses would be comprised of 10,744 gsf of general retail, 42,976 gsf of supermarket use, 16,116 gsf of sit-down restaurant, and 37,604 gsf of quick service restaurant. Partial Preservation 4 Alternative would also include 100,938 gsf of community facilities (e.g., childcare,

media library, or community center; same as the project) and 25,000 gsf of entertainment/assembly uses (same as the project). There would also be 876,750 gsf of parking (45,231 gsf less than the project), providing 2,502 parking spaces (120 fewer than the project), including a centralized parking facility.

Overall, the total building area would be 5,126,349 gsf, which is a slight reduction in the magnitude of the development compared to the proposed project (5,367,860 gsf or about 96 percent of the proposed project). Buildings heights would generally be the same as those identified for the proposed project, ranging from 65 to 180 feet, with a 300-foot tower on Block 6. In addition, similar to the proposed project, there would be three 180-foot buildings on Blocks 1, 5, and 7.

Alternative G, like all the preservation alternatives, would not reduce any of the open space elements of the proposed project. Similar to the proposed project, this alternative would include 6.2 acres of open space, including a rooftop playing field and extension of the Blue Greenway and Bay Trail through the project site. This alternative would also include the proposed dock and associated wharf and gangway along the bay shoreline.

6.C.7.2 Alternative G: Historical Resources and Transportation Features

With respect to historical resources, Alternative G would retain the façades of Station A, the Compressor House, and the Meter House, and it would add new construction within and above these three structures. However, due to the unknown design of the new construction, the combination of the retained/rehabilitated façades of these structures and new interior construction, the resultant structure would not necessarily be in accordance with the Secretary of the Interior's Standards. The Gate House would be demolished. Within the façade of Station A would be a 125-foot office building in the southern portion and a 300-foot tower in the northern portion. Within the façades of the Compressor House and the Meter House, the ground floor would be retail uses, while the upper floors in the new construction above the Compressor House would be office uses. The Unit 3 Power Block would be retained and converted to a hotel. Similar to the proposed project, the Boiler Stack would be retained and repurposed as a ground floor retail space (though allowable uses could also include entertainment, arts, and recreation), but unlike the proposed project, it would also be rehabilitated in accordance with the Secretary of the Interior's Standards.

With respect to transportation features, the interior street network of Alternative F would be similar to the proposed project and would connect with the planned street network on the Pier 70 Mixed-Used District site directly to the north of the project site; however, Georgia Lane, on the east side of the Compressor House and Meter House, would be narrower, with sidewalks only on one side of the lane. Like the proposed project, this alternative would provide for a future Muni bus stop on 23rd Street, construct sidewalk improvements on Illinois Street, and install new traffic signals at Illinois/23rd and Illinois/Humboldt. Similarly, this alternative would include a transportation demand management (TDM) plan and a transit shuttle service as described for the proposed project.

6.C.7.3 Alternative G: Travel Demand Assumptions

On a daily basis, Alternative G would generate a total of 91,881 person trips by all modes, compared to 93,609 person trips for the proposed project (i.e., 1,728 fewer person trips). The number of external person trips and vehicle trips generated by Alternative G would be similar to the proposed project. During the a.m. peak hour, Alternative G would generate 4,985 external person trips by all modes and 1,800 external vehicle trips, compared to 5,139 external person trips and 1,862 external vehicle trips for the proposed project (i.e., 154 fewer person trips and 62 fewer vehicle trips). During the p.m. peak hour, Alternative G would generate 7,693 external person trips by all modes and 2,482 external vehicle trips, compared to 7,823 external person trips and 2,540 external vehicle trips for the proposed project (i.e., 130 fewer person trips and 58 fewer vehicle trips).

6.C.7.4 Alternative G: Construction

Construction of Alternative G would be similar to the proposed project, both in magnitude and duration, but construction activities associated with retaining the façades of Station A, the Compressor House, and the Meter House would be incorporated into the construction plan. In general, the same types of construction activities and equipment would be required. Construction of Alternative G would take about the same amount of time as the proposed project. It is anticipated that construction would start in 2020 and be completed in 2036, the same 15-year construction duration as the proposed project. Construction would occur in six phases, similar to the proposed project. Like the proposed project, actual construction dates would be affected by the PG&E remediation process and market conditions and would not start until all necessary permits are secured.

Like the proposed project, the project sponsor would conduct a human health risk assessment for the proposed sensitive land uses (residential/day care), and the San Francisco Regional Water Quality Control Board may require the project sponsor to implement additional onsite remediation to accommodate the proposed uses and/or to address previously unknown contaminants that may potentially be discovered during the course of project construction. The project sponsor would implement any additional onsite remediation requirements as part of the project implementation.

6.D Alternatives Analysis

6.D.1 Impacts of Alternatives

This section presents the detailed analysis of the impacts of the selected alternatives compared to the proposed project. Each of the seven alternatives are analyzed for all the same resource topics presented in Chapter 4 and the initial study (Appendix B). The impact analysis is based on the same environmental setting and significance thresholds presented for each resource topic in Chapter 4. Except as noted, the impact analysis of the alternatives is qualitative, relative to the identified impacts of the project, and the reader is referred to Chapter 4 and the initial study for the more detailed analysis. For transportation, noise, and air quality, however, the analyses are

quantitative in order to provide a more refined comparison of the severity of impacts associated with the alternatives relative to those of the proposed project.

6.D.1.1 Land Use

Like the proposed project, none of the seven alternatives would physically divide an established community. As described in Chapter 4, Section 4.B, the project site is isolated from the Central Waterfront area, and any development on the project site, such as those described in Alternatives A through G, would reconnect the site to the established surrounding community, both through the proposed street network and publicly accessible open spaces and shoreline access. Therefore, for all alternatives, like the proposed project, this impact, both at a project level and at a cumulative level, would be ***less than significant***.

Similarly, like the proposed project, none of the seven alternatives would conflict with applicable land use plans or policies adopted for purposes of avoiding or reducing environmental impacts, such that a substantial adverse physical change in the environment related to land use would result. Alternative A, by definition, would be consistent with the Planning Code, and it would be consistent with other plans because it would continue the site's historic largely industrial use while providing new public access to the Bay and publicly accessible open spaces, including the Bay Trail and Blue Greenway. The development scenarios under Alternatives B through G are not substantially different from the proposed project with respect to this impact. For Alternatives B through G, if the Board of Supervisors finds that amendments to the General Plan and Planning Code are warranted to allow for implementation of the alternative, conflicts between the General Plan and Planning Code, and the alternative would be resolved through legislative amendment to the General Plan and Planning Code. To the extent that physical environmental impacts may result from such conflicts for Alternatives B through G, this section discloses and analyzes these physical impacts under the relevant environmental topic sections, below. Therefore, for all alternatives, like the proposed project, this impact, both at a project level and a cumulative level, would be ***less than significant***.

6.D.1.2 Aesthetics

Like the proposed project, all seven alternatives would be located on an infill site, within a transit priority area, and would include an employment center. Therefore under CEQA section 21099, aesthetics are not to be considered in determining significant environmental effects of any of the alternatives.

6.D.1.3 Population and Housing

Like the proposed project, construction of Alternatives A through G would not induce substantial population growth, because project construction workers would likely be drawn from the local and regional construction work force. In all cases, the magnitude and duration of construction would be similar to or less than that of the proposed project, and for the same reasons described in Chapter 4, Section 4.C, construction workers for any of the alternatives would likely be drawn from the local and regional construction work force such that none of the alternatives would induce population growth by attracting a substantial number of construction workers from outside of the region.

Therefore, under all alternatives, like the proposed project, project construction would not create demand for additional housing or other facilities and services associated with growth, and the growth-inducing impact of construction of any of the alternatives would be ***less than significant***.

Similar to the proposed project, the operation of Alternatives A through G would not induce substantial population growth beyond growth planned for the city or region. In all cases, the proposed development plan for Alternatives A through G would be similar to or less than that of the proposed project, such that residential population growth or employment growth generated by the alternatives would be the same as or less than that of the proposed project, and this growth would be consistent with the City's and regional plans for growth in the area. Therefore, like the proposed project, the operational growth-inducing impacts of all alternatives, at both a project and cumulative level, would be ***less than significant***.

As described in Chapter 4, Section 4.C, none of the alternatives would displace existing housing or substantial numbers of people because the project site is currently a mostly vacant industrial site which does not include residential uses. Therefore, like the proposed project, there would be ***no impact*** on housing or population displacement for any of the alternatives.

6.D.1.4 Cultural Resources

Archeological Resources, Human Remains, and Tribal Cultural Resources

As described in the initial study in Appendix B, any ground-disturbing activities during project construction—particularly excavation, grading, and foundation work—could have the potential to uncover terrestrial prehistoric archeological resources, submerged prehistoric archeological resources, historic archeological resources, tribal cultural resources, and/or human remains. This same impact would be true of all of the alternatives, since ground-disturbing activities, including excavation, would be required for construction of all alternatives. However, implementation of Mitigation Measures M-CR-1, Archeological Testing, and M-CR-3, Tribal Cultural Resources Interpretive Program, would (1) require the development of an archeological testing program to determine presence or absence of such resources; (2) ensure that work would halt if sensitive resources are inadvertently discovered during project implementation; and (3) require that proper procedures are followed to ensure appropriate treatment of significant resources, including tribal cultural resources. Therefore, for Alternatives A through G, project and cumulative impacts on archeological resources, human remains, and tribal cultural resources would be ***less than significant with mitigation***, the same as for the proposed project, and the same mitigation measures would apply to all alternatives.

Historic Architectural Resources

Project impacts on historic architectural resources are described in Chapter 4, Section 4.D, and as described below, impacts of the full and partial preservation alternatives on these resources are reduced compared to the project. See Section 4.D for a more detailed description of the impacts. Potential construction impacts on onsite historic resources to be retained and/or rehabilitated under the full and partial preservation alternatives are described below under Noise and Vibration, page 6-67.

Impacts on Individual Historical Resources

Alternative A (No Project/Code Compliant Alternative) would demolish Station A, the Meter House, and the Compressor House, the three resources on the project site that are individually eligible for the California Register, the same effect as the proposed project. Once demolished, these structures would no longer be eligible as historical resources under CEQA. And like the proposed project, the same measures—Mitigation Measures M-CR-5a, 5b, and5c—requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Therefore, like the proposed project, the impact on individual historical resources under Alternative A would be ***significant and unavoidable with mitigation***.

Alternatives B and C (Full Preservation Alternatives) are both full preservation alternatives, and they would restore and rehabilitate Station A, the Meter House, and the Compressor House in a manner consistent with the Secretary of the Interior's Standards. However, implementation of Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that these historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, the impact on individually eligible historical resources under Alternatives B and C would be ***less than significant with mitigation***.

Alternative D (Partial Preservation 1 Alternative) would restore and rehabilitate Station A in accordance with the Secretary of the Interior's Standards, but would demolish the Meter House and the Compressor House, two individually eligible resources. Once demolished, these structures would no longer be eligible as historical resources under CEQA. Thus, like the proposed project, the same measures—Mitigation Measures M-CR-5a, 5b, and 5c—requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, like the proposed project but to a lesser degree, the impacts on individually eligible historical resources under Alternative D would be ***significant and unavoidable with mitigation***.

Alternative E (Partial Preservation 2 Alternative) would restore and rehabilitate the southern portion of Station A in accordance with the Secretary of the Interior's Standards to the extent feasible, but would demolish the northern portion of Station A as well as the Meter House and the Compressor House. Once demolished, these structures would no longer be eligible as historical resources under CEQA. For the purposes of this analysis, it is assumed that demolition of the northern portion of Station A would render this structure ineligible for the California Register along with the other two buildings. Like the proposed project, the same measures—Mitigation Measures M-CR-5a, 5b, and 5c—requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, like the proposed project but to a

lesser degree (but to a greater degree than Alternative D), the impacts on individually eligible historical resources under Alternative E would be ***significant and unavoidable with mitigation***.

Alternative F (Partial Preservation 3 Alternative) would restore and rehabilitate the Meter House and the Compressor House in accordance with the Secretary of the Interior's Standards, but would demolish Station A. Once demolished, this structure would no longer be eligible as a historical resource under CEQA. Like the proposed project, the same measures—Mitigation Measures M-CR-5a, 5b, and 5c—requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, like the proposed project but to a lesser degree, the impacts on individually eligible historical resources under Alternative F would be ***significant and unavoidable with mitigation***.

Alternative G (Partial Preservation 4 Alternative) would retain the façades of Station A, the Meter House, and the Compressor House, but would not necessarily rehabilitate these structures in accordance with the Secretary of the Interior's Standards. However, this alternative would not necessarily rehabilitate Station A, the Meter House, and the Compressor House in accordance with the Secretary of the Interior's Standards because façade retention alone may not be sufficient to preserve the distinctive character of these historic buildings, particularly given the vertical additions to two structures. Under this alternative, two buildings would be altered with respect to their historic massing, spatial relationships, and proportions, likely resulting in a loss of integrity of design, setting, and feeling, which are three of the seven characteristics of integrity necessary for a resource to be eligible for the California Register. Although the smaller Meter House would not be increased in height, it would be diminished in scale next to the taller Compressor House, thus potentially losing integrity of setting and feeling. While the three buildings might retain integrity of materials (at least in part), association (with historic events and persons), location, and workmanship, this might not be sufficient for the buildings to retain California Register eligibility, particularly if complete façade retention is not feasible. Assuming the structures are not rehabilitated in accordance with the Secretary's Standards, they may no longer be eligible as historic resources under CEQA. Thus, like the proposed project, the same measures—Mitigation Measures M-CR-5a, 5b, and 5c—requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained historic resources and façades would be protected during construction of the rest of the development. Therefore, like the proposed project but to a lesser degree, the impacts on individually eligible historic resources under Alternative G would be ***significant and unavoidable with mitigation***.

Demolition and Alteration Impacts on the Third Street Industrial District

Alternative A (No Project/Code Compliant Alternative) would result in demolition or substantial and adverse alteration of five buildings and structures that contribute to the significance of the Third Street Industrial District. These are Station A, the Gate House, the Meter House, the

Compressor House, and the Unit 3 Power Block. Like the proposed project, the Boiler Stack would be retained, and assuming implementation of Mitigation Measures M-CR-5d (Rehabilitation of the Boiler Stack), M-CR-5e (Historic Preservation Plan and Review Process for Alteration of the Boiler Stack) and M-NO-4a, 4b, and 4c (regarding vibration monitoring and vibration controls), this historic structure would be rehabilitated consistent with appropriate performance standards approved by Planning Department preservation staff. Impacts on the Boiler Stack, similar to the proposed project, would be *less than significant with mitigation*.

Nevertheless, according to the HRER, the demolition of these contributors (i.e., Station A, the Gate House, the Meter House, the Compressor House, and the Unit 3 Power Block) would result in "the loss of the above characteristics that justify, in part, the district's eligibility for the California Register" and would "remove historic materials, features, and spaces that characterize the historic district and justify the existing district boundary, and … result in physical destruction, damage or alteration such that the significance of the district [would] be materially impaired." As with individual resources, Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program would lessen the severity of the impact but not to a less-than-significant level. Therefore, overall, like the proposed project, the impact of demolition of these buildings and its effect on the integrity of the Third Street Industrial District, despite the rehabilitation of the Boiler Stack, would be ***significant and unavoidable with mitigation***.

Alternatives B and C (Full Preservation Alternatives) would retain and rehabilitate the six buildings and structures that contribute to the significance of the Third Street Industrial District in accordance with the Secretary of the Interior's Standards. These are Station A, the Gate House, the Meter House, the Compressor House, the Unit 3 Power Block, and the Boiler Stack. For these alternatives, it is assumed that rehabilitation of the Unit 3 Power Block would be feasible, even if the reuse of the structure were more limited than under the proposed project. With the rehabilitation of these structures in accordance with the Secretary's Standards, these resources would maintain their significance as contributors to the Third Street Historic District. However, it is assumed that mitigation measures similar to Mitigation Measure M-CR-5e (Historic Preservation Plan and Review Process for Alteration of the Boiler Stack) would be required for all six historical structures, not just the Boiler Stack. In addition, Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that these historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, the alteration impacts on the physical characteristics of the Third Street Industrial District under Alternatives B and C would be ***less than significant with mitigation***.

Alternative D (Partial Preservation 1 Alternative) would retain Station A and the Boiler Stack and rehabilitate these structures consistent with the Secretary of Interior's Standards, but three contributing resources, the Meter House, the Compressor House, and the Gate House, would be demolished. The Unit 3 Power Block would be retained and reused, but alterations may not be in accordance with Secretary's Standards. If Alternative D is constructed as proposed, the resultant count would be 50 architectural resources remaining in the district, 22 of which are contributing resources (approximately 44 percent) and 28 of which are non-contributing resources

(approximately 56 percent). Given that Station A is the largest and one of the most visually prominent buildings on the project site, is one of the oldest buildings in the district, represents a relatively rare typology of large industrial brick building within the district, and is associated with the site's long history of power generation, retention and rehabilitation of this building such that it would retain its historic integrity, along with retention of the Unit 3 Power Block and retention and historically sensitive rehabilitation of the Boiler Stack, would sufficiently lessen effects on the Third Street Industrial District, compared to those of the proposed project, such that unlike the proposed project, effects on the district would be considered ***less than significant with mitigation***. Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program would apply to this alternative with respect to the buildings to be demolished (i.e., Meter House, Compressor House, and Gate House) or substantially altered (i.e., Unit 3 Power Block), and Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development.

Alternative E (Partial Preservation 2 Alternative) would retain and rehabilitate the southern portion of Station A in accordance with the Secretary of the Interior's Standards to the extent feasible and would rehabilitate the Boiler Stack in accordance with the Secretary's Standards. However, this alternative would demolish the northern portion of Station A as well as the Meter House, the Compressor House, and the Gate House. The Unit 3 Power Block would be retained, but alterations may not be in accordance with the Secretary's Standards. Retention of a portion of Station A would retain the following characteristics of the district that justify, in part, its eligibility for the California Register: prominent industrial brick building typology, industrial facilities from the turn of the 20th century, and association with early 20th century power generation. Retention of Station A would also help to visually connect the Spreckels Sugar Warehouses on 23rd Street and the Unit 3 power block and Boiler Stack on the project site with the rest of the district on Third Street. Therefore, retention of a portion of Station A, retention of the Unit 3 Power Block, and retention and rehabilitation of the Boiler Stack, would sufficiently lessen effects on the Third Street Industrial District, compared to those of the proposed project, such that unlike the proposed project, effects on the district would be considered ***less than significant with mitigation***. Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program would apply to this alternative with respect to the buildings to be demolished (i.e., northern portion of Station A as well as the Meter House, Compressor House, and Gate House) or substantially altered (i.e., Unit 3 Power Block), and Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development.

Alternative F (Partial Preservation 3 Alternative) would retain and rehabilitate the Meter House, the Compressor House, and the Boiler Stack in accordance with the Secretary of the Interior's Standards, but would demolish Station A and the Gate House. The Unit 3 Power Block would be retained, but alterations may not be in accordance with the Secretary's Standards. Although the demolition of or substantial alterations to Station A, the Gate House, and the Unit 3 Power Block would reduce the association of the remaining three contributors to the main portion of the

historic district along Third Street., the retention and rehabilitation in accordance with the Secretary's Standards of the Meter House, Compressor House, and Boiler Stack would help to retain the continuity of the historic district between 23rd Street and rest of the district on Third Street. Additionally, the physical prominence and unique building typologies of the Meter House, the Compressor House, and the Boiler Stack would maintain continuity with the Third Street Industrial District's broader industrial themes. Despite the loss of three of the 25 district contributors and the changes to the historic district's integrity of setting due to new construction on the project site, rehabilitation of the unique qualities of the Meter House, the Compressor House, and the Boiler Stack would allow the Third Street Industrial District to retain its eligibility for listing in the California Register. Rehabilitation of these three district contributors in accordance with the Secretary's Standards plus implementation of Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program with respect to the buildings to be demolished (i.e., Station A and the Gate House) or substantially altered (i.e., the Unit 3 Power Block) would reduce the impacts to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development Therefore, unlike the proposed project, this alternative's effect on the Third Street Industrial District would be ***less than significant with mitigation***.

Alternative G (Partial Preservation 4 Alternative) would rehabilitate the Boiler Stack in accordance with the Secretary of the Interior's Standards and retain the façades of Station A, the Meter House, and the Compressor House, with new vertical construction built within and above Station A and the Compressor House. However, this alternative would not necessarily rehabilitate Station A, the Meter House, and the Compressor House in accordance with the Secretary of the Interior's Standards because façade retention alone may not be sufficient to preserve the distinctive character of these historic buildings, particularly given the vertical additions to two structures.

Under this alternative, the Gate House would be demolished. The Unit 3 Power Block would be retained, but alterations may not be in accordance with Secretary's Standards. In summary, one of the six contributors would be retained in accordance with the Secretary's Standards, four would be retained in part, and one contributor would be demolished. Although retaining the façades of Station A, the Meter House, and the Compressor House would help communicate the character-defining features of the historic district to an extent, it would also adversely affect the integrity of these buildings. Likewise, the integrity of the Unit 3 Power Block would be diminished. Although the historic buildings that are retained, in whole or in part, would remain in proximity to the contributing Western Sugar Refinery Warehouses immediately to the south of the project site, the overall industrial character of the project site would be compromised. Nevertheless, in terms of the district as a whole, the preservation of five contributors in whole or in part would continue to communicate the Third Street Industrial District's industrial themes. Despite the loss of the Gate House, the partial loss or alteration of four contributing structures, and changes to the historic district's integrity of setting due to new construction on the project site, this alternative would retain sufficient character-defining features of the Third Street Industrial District on the project site (such as prominent industrial brick building typology, industrial facilities from the turn of the 20th century, and association with early 20th century

power generation) and elsewhere within the district to allow the Third Street Industrial District to retain its eligibility for listing in the California Register. These considerations plus implementation of Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program with respect to the building to be demolished (i.e., the Gate House) or substantially altered (i.e., the Unit 3 Power Block) would reduce the impacts to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, this alternative's effect on the Third Street Industrial District would be ***less than significant with mitigation***.

Infill Construction Impacts on the Third Street Industrial District

Under all alternatives, new construction could be of a size, scale, and density and/or could use exterior materials that would be incompatible with the Third Street Industrial District. This would adversely affect the integrity of the Third Street Industrial District's setting and feeling. However, in and of itself and apart from the demolition and/or adverse alteration of several district contributors, evaluated above, the density and height of new construction would not necessarily affect the historic district's overall integrity such that the district would no longer be able to convey its historic significance. Given the limited design detail available for any of the alternatives, like the proposed project, it is conservatively determined that the new construction of any of the alternatives could be incompatible with the Third Street Industrial District, a significant impact. However, for all alternatives, implementation of Mitigation Measure M-CR-6, Design Controls for New Construction, future new construction would be compatible with the character-defining features of the Third Street Historic District. Therefore, like the proposed project, for Alternatives A through G, this impact would be ***less than significant with mitigation***.

Impacts on the Union Iron Works Historic District

Like the proposed project, all alternatives could have an indirect visual impact on the Union Iron Works Historic District located directly north of the project site. But similar to the proposed project, the Pier 70 Mixed-Use District project includes planned infill construction between the closest contributing properties in this historic district and the project site. The planned infill construction on the Pier 70 site will introduce a new roadway and new construction with heights up to 90 feet along the southern edge of the Union Iron Works Historic District. New construction from any of the alternatives would be more than 200 feet away from contributing properties in this historic district. Additionally, new construction under any of the alternatives would be contemporary in design and materials such that the character-defining features and form of the Union Iron Works Historic District would be clearly differentiated from new development on the project site. For these reasons, the indirect visual impacts of any of the alternatives, like the proposed project, would be those of a project that "demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by the lead agency for purposes of CEQA." Therefore, like the proposed project, this impact would be ***less than significant*** for all alternatives.

Cumulative Impacts on Third Street Industrial District

As described in Chapter 4, Section 4.D, past, present, and reasonably foreseeable future projects will result in the loss of seven contributing resources to demolition or substantial alteration, which in combination with the impact on historical resources associated with the various alternative would be a cumulative impact on the Third Street Industrial District.

Alternative A (No Project/Code Compliant Alternative) would demolish or substantially alter all district contributors other than the Boiler Stack. Like the proposed project, the demolition or substantial alteration under Alternative A would be a considerable contribution to the cumulative impact on the Third Street Industrial District, a significant impact. Implementation of Mitigation Measures M-CR-5a, 5b, 5c, 5d, and 5e and M-CR-6 would reduce the severity of the contribution, but not to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the Boiler Stack would be protected during construction of the rest of the development. Therefore, like the proposed project, Alternative A would make a considerable contribution to a cumulative impact on the Third Street Industrial District. The impact would be ***significant and unavoidable with mitigation***, the same as the proposed project.

Alternatives B and C (Full Preservation Alternatives). The two Full Preservation Alternatives would retain and rehabilitate the six district contributors in a manner consistent with the Secretary of Interior's Standards. Therefore, neither of these two alternatives would result in a cumulatively considerable contribution to the cumulative impact on the Third Street Industrial District. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, the cumulative impact of Alternatives B and C on the Third Street Industrial District would be ***less than significant with mitigation***.

Alternative D (Partial Preservation 1 Alternative). Alternative D would retain and rehabilitate Station A in a manner consistent with the Secretary of Interior's Standards, thereby retaining intact the largest and most visually prominent structure on the project site associated with the site's history of power generation. This feature, along with retention of the Unit 3 Power Block and retention and historically sensitive rehabilitation of the Boiler Stack, which would be retained, repurposed, and rehabilitated consistent with Secretary's Standards, would lessen the contribution of this alternative to the cumulative impacts on the Third Street Industrial District. Furthermore, implementation of Mitigation Measures M-CR-5a, 5b, and 5c, requiring documentation, public interpretation, and a salvage program would apply to this alternative with respect to the buildings to be demolished (i.e., the Meter House, the Compressor House, and the Gate House) or substantially altered (i.e., the Unit 3 Power Block), such that the overall contribution of this alternative to the cumulative impact on the Third Street Industrial District would be less than significant. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, the contribution of Alternative D on the cumulative impacts on the Third Street Industrial District would be ***less than significant with mitigation***.

Alternatives E, F, and G (Partial Preservation 2, 3, and 4 Alternatives) would demolish and/or substantially alter important district contributors, including Station A, the Meter House, the Compressor House, and the Gate House. The Boiler Stack would be retained and rehabilitated consistent with the Secretary of Interior's Standards. However, in all cases, these partial preservation alternatives would retain certain character-defining features of at least two or more contributors to the historic district, sufficient to provide a link to the rest of the Third Street Industrial District and would allow the district to retain its eligibility for listing in the California Register. These considerations plus implementation of Mitigation Measures M-CR-5a, 5b, and 5c with respect to the buildings to be demolished or substantially altered and implementation of Mitigation Measure M-CR-6 with respect to design controls for new construction within the district would reduce the contribution of these alternatives to the cumulative impact to a less-than-significant level. Mitigation Measures M-NO-4a, 4b, and 4c regarding vibration monitoring and vibration controls would be required to ensure that the retained and rehabilitated historic resources would be protected during construction of the rest of the development. Therefore, unlike the proposed project, the contribution of Alternatives E, F, and G on the cumulative impact on the Third Street Industrial District would be ***less than significant with mitigation***.

6.D.1.5 Transportation and Circulation

Transportation impacts of the proposed project are described in Chapter 4, Section 4.E, and as described below, transportation impacts of the alternatives would be similar. See Section 4.E for a more detailed description of the impacts.

Construction-related Transportation Impacts

Construction-related transportation impacts associated with Alternatives A through G would be similar to the proposed project, and like the project, these impacts would be less than significant. Improvement Measure I-TR-A, Construction Management Plan and Public Updates, identified for the proposed project, would also be applicable to all alternatives.

Alternative A (No Project/Code Compliant Alternative) would include similar construction activities as the proposed project. However, Alternative A would entail substantially less construction than the proposed project. The construction duration would be shorter (by seven years), compared to the proposed project, given the reduced level of overall square footage and internal street network improvements. Like the proposed project, the construction-related transportation impacts of Alternative A would be ***less than significant***, albeit also less severe than those of the project.

Alternatives B through G (Full and Partial Preservation Alternatives) would include similar construction activities as under the proposed project as they would involve construction of a similar number of buildings and buildout of the internal street network. The construction duration of Alternative B would be four years shorter (11 years), than the proposed project (15 years), given the reduced level of overall square footage and internal street network improvements. The construction duration of Alternatives C through G would be the same as under the proposed project. Therefore, like the proposed project, the construction-related

transportation impacts of Alternatives B through G would be ***less than significant***, albeit impacts of Alternative B would be somewhat less severe than those of the project.

VMT Impacts

Similar to the proposed project, all alternatives would be located in an area where the existing VMT is more than 15 percent below the existing regional average for non-residential uses. In addition, the project site meets the Proximity to Transit screening criterion, which also indicates that the proposed uses under any of the alternatives would not result in substantial additional VMT. All alternatives would generate fewer daily vehicle trips than the proposed project and therefore would generate less daily VMT than the proposed project. Alternative A would implement measures to meet the requirements of the TDM Ordinance, while Alternatives B, C, D, E, F and G would include a TDM Plan similar to the proposed project. Similar to the proposed project, the alternatives' features that would alter the transportation network (e.g., buildout of the internal street network, reconstruction of the sidewalk on the north side of 23rd Street, and restriping of 23rd Street east of Illinois Street to provide bicycle lanes in both directions and new traffic signals) would fit within the general types of projects that would not substantially induce automobile travel. Therefore, similar to the proposed project, the impacts related to VMT for Alternatives A through G would be ***less than significant***.

Traffic Hazard Impacts

Traffic hazard impacts associated with Alternatives A through G would be similar to the proposed project, and like the project, these impacts would be less than significant. For all alternatives, as with the proposed project, street network designs would be required to undergo more detailed design and review to ensure that they are designed to meet City design standards. The street designs would be subject to approval by the SFMTA, Public Works, and the San Francisco Fire Department, along with other City agencies, to ensure that the streets are designed consistent with City policies and design standards and do not result in traffic hazards. Improvement Measure I-TR-B, Monitoring and Abatement of Queues, identified for the proposed project, would also be applicable to all alternatives.

Alternative A (No Project/Code Compliant Alternative). Under Alternative A, the interior street network would not be the same as under the proposed project. However, the streets would meet the standards for industrial streets within the Better Streets Plan to ensure that the streets and vehicular access to the buildings do not result in traffic hazards. Roadway widths would be designed to accommodate trucks and other vehicles associated with PDR uses. Alternative A would generate substantially fewer daily vehicle trips than the proposed project (6,635 daily vehicle trips for Alternative A, compared to 19,522 vehicle trips for the proposed project), and, similar to the proposed project, this increase in traffic volumes on the surrounding roadways would not be considered a traffic hazard. Therefore, as with the proposed project, impacts related to traffic hazards under Alternative A would be ***less than significant***.

Alternatives B, C, D, E, F, and G (Full Preservation/Reduced Program, Full Preservation/Similar Program, and Partial Preservation Alternatives). Under Alternatives B through G, the street network within the project site would be similar to the proposed project, and would be designed

consistent with the Better Streets Plan to prioritize safe bicycle and pedestrian travel within the site, limit curb cuts into garages and loading facilities, and provide adequate turning radii and sight distances at intersections and driveways. Alternatives B, C and D would not include Georgia Lane, while Alternatives F and G would provide a narrower Georgia Lane with a sidewalk on one side of the street. The internal street network for Alternative E would be the same as for the proposed project. In addition, similar to the proposed project, Alternatives B through G would include new traffic signals at the intersections of Illinois Street/23rd Street and Illinois Street/Humboldt Street.

Alternatives B through G would generate fewer daily vehicle trips than the proposed project (between 13,045 and 19,256 daily vehicle trips for Alternatives B through G, compared to 19,522 vehicle trips for the proposed project), and, similar to the proposed project, this increase in traffic volumes on the surrounding roadways would not be considered a traffic hazard. Therefore, similar to the proposed project, impacts related to traffic hazards under Alternatives B through G would be ***less than significant***.

Transit Impacts

Alternative A (No Project/Code Compliant Alternative). Unlike the proposed project, Alternative A would not include transit shuttle service between the project site and Caltrain's 22nd Street station, and BART's 16th Street station. Alternative A would also generate substantially fewer transit trips than the proposed project. During the weekday a.m. peak hour, Alternative A would generate 247 transit trips compared to 1,796 transit trips for the proposed project (i.e., 1,549 fewer transit trips), while during the weekday p.m. peak hour Alternative A would generate 337 transit trips compared to 2,223 transit trips for the proposed project (i.e., 1,886 fewer transit trips).

- The transit trips generated by Alternative A would be accommodated within SFMTA's capacity utilization standard on the T Third light rail line, as well as on the 22 Fillmore and 48 Quintara bus routes serving the project site, and therefore, unlike the proposed project, impacts related to Muni capacity would be less than significant. In addition, unlike for the proposed project, Alternative A would not affect Muni transit operations in terms of increases in transit travel times. Therefore, unlike the proposed project, impacts of Alternative A on Muni capacity utilization and transit operations would be ***less than significant***. Proposed project Mitigation Measure M-TR-4, Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Bus Routes and Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, would not be applicable to this alternative.

- Similar to the proposed project, transit trips generated by Alternative A would be accommodated on the regional transit providers, with the exception of BART to the East Bay which currently operates at more than the regional capacity utilization standard in the peak direction during the a.m. and p.m. peak hours. Alternative A would not contribute considerably to ridership on BART from the East Bay during the a.m. peak hour and to the East Bay during the p.m. peak hour, and therefore regional transit capacity utilization impacts would be less than significant. In addition, similar to the proposed project, Alternative A would not affect regional transit operations. Therefore, similar to the proposed project, impacts of Alternative A on regional transit would be ***less than significant***.

Alternative B (Full Preservation/Reduced Program Alternative). Similar to the proposed project, Alternative B would include transit shuttle service between the project site and Caltrain's 22nd

Street station, and BART's 16th Street station. Alternative B would generate about 34 percent fewer transit trips than the proposed project. Alternative B would generate 1,189 transit trips compared to 1,796 transit trips for the proposed project (i.e., 607 fewer transit trips) during the weekday a.m. peak hour, and 1,472 transit trips compared to 2,223 transit trips for the proposed project (i.e., 751 fewer transit trips) during the weekday p.m. peak hour.

- Similar to the proposed project, the new transit trips would be accommodated on the T Third light rail line, and would not be accommodated on the 48 Quintara/24th Street route. However, unlike the proposed project, Alternative B's transit trips on the 22 Fillmore route would be accommodated without exceeding SFMTA's capacity utilization standard. To mitigate the impacts of Alternative B on the 48 Quintara/24th Street route, Alternative B would require a mitigation measure similar to a portion of Mitigation Measure M-TR-4, Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Routes, which was identified for the proposed project. Implementation of the portion of the measure related to the 48 Quintara/Street route, would reduce the effect of increased ridership on this route to less-than-significant levels. However, similar to the proposed project, because it is not known whether SFMTA would be able to provide additional service on this route, the impact of Alternative B on the 48 Quintara/24th Street route would be considered ***significant and unavoidable with mitigation***.

- Unlike the proposed project, Alternative B would not impact Muni transit operations on the 22 Fillmore or the 48 Quintara/24th Street bus routes in terms of increases in transit travel times. Therefore, unlike the proposed project, the impact of Alternative B on Muni transit operations would be ***less than significant***. Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, would not be applicable to this alternative.

- Similar to the proposed project, the transit trips generated by Alternative B would be accommodated on the regional transit providers, with the exception of BART to the East Bay which currently operates at more than the regional capacity utilization standard in the peak direction during both the a.m. and p.m. peak hours. Similar to the proposed project, Alternative B would not contribute considerably to ridership on BART from the East Bay during the a.m. peak hour and to the East Bay during the p.m. peak hour, and therefore regional transit capacity utilization impacts would be less than significant. In addition, similar to the proposed project, Alternative B would not affect regional transit operations and impacts of Alternative B on regional transit would be ***less than significant***.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Similar to the proposed project, Alternatives C through G would include transit shuttle service between the project site, and Caltrain's 22nd Street station, and BART's 16th Street station. Alternatives C through G would generate a similar number of transit trips as the proposed project. Alternatives C through G would generate between 1,695 and 1,767 transit trips compared to 1,796 transit trips for the proposed project (i.e., between 29 and 101 fewer transit trips) during the weekday a.m. peak hour, and between 2,131 and 2,195 transit trips compared to 2,223 transit trips for the proposed project (i.e., between 28 and 92 fewer transit trips) during the weekday p.m. peak hour.

- Similar to the proposed project, the new transit trips would be accommodated within SFMTA's capacity utilization standard on the T Third light rail line, but not on the 22 Fillmore or the 48 Quintara bus routes. Implementation of Mitigation Measure M-TR-6,

Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Routes, identified for the proposed project, would reduce the effect of increased ridership on these routes to less-than-significant levels. However, similar to the proposed project, because it is not known whether SFMTA would be able to provide additional service on these routes, the impact of Alternatives C through G on the 22 Fillmore and the 48 Quintara/24th Street routes would be considered ***significant and unavoidable with mitigation***.

- Similar to the proposed project, Alternatives C through G would result in significant impacts on Muni transit operations on the 22 Fillmore or 48 Quintara/24th Street bus routes in terms of increases in transit travel times. Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, would be applicable to this alternative. Similar to the proposed project, because it is not certain that implementation of this mitigation measure would reduce project-generated vehicles to mitigate significant impacts of the alternatives to less-than-significant levels, the impact of Alternatives C through G on Muni transit operations would be ***significant and unavoidable with mitigation.***

- Similar to the proposed project, transit trips generated by Alternatives C through G would be accommodated on the regional transit providers, with the exception of BART to the East Bay which currently operates at more than the regional capacity utilization standard in the peak direction during the a.m. and p.m. peak hours. Similar to the proposed project, Alternatives C through G would not contribute considerably to ridership on BART from the East Bay during the a.m. peak hour and to the East Bay during the p.m. peak hour, and therefore regional transit capacity utilization impacts would be less than significant. In addition, similar to the proposed project, Alternatives C through G would not affect regional transit operations. Therefore, similar to the proposed project, impacts of Alternatives C through G on regional transit would be ***less than significant***.

Walking/Accessibility Impacts

Alternative A (No Project/Code Compliant Alternative). Under Alternative A, unlike the proposed project, the street network within the project site and on 23rd Street east of Illinois Street would be built out to Better Streets Plan standards for industrial streets. Unlike the proposed project, Alternative A would not reconstruct the sidewalk on the east side of Illinois Street between Humboldt and 22nd streets, nor signalize the intersection of Illinois Street/Humboldt Street. It is anticipated that under Alternative A the intersection of Illinois Street/23rd Street would be signalized, similar to the proposed project. In addition, similar to the proposed project, Alternative A would provide a multi-use trail along the waterfront.

Because the total building area of Alternative A would be about 27 percent of the proposed project and would primarily consist of PDR uses, Alternative A would result in substantially fewer person-trips compared to the proposed project, and people walking to and from the site would be accommodated on existing sidewalks and proposed sidewalks within and adjacent to the project site. Alternative A would result in an increase in the number of vehicles, pedestrians, and bicycles in the vicinity of the project site. However, this increase would be substantially less than under the proposed project, and, unlike the proposed project, would not be substantial enough to impede people walking on adjacent sidewalks and crosswalks, or affect pedestrian safety and accessibility. Unlike the proposed project, Alternative A would not result in a substantial number of people crossing at the unsignalized intersection of Illinois Street/22nd Street, and therefore would not result in a significant impact related to pedestrian safety and

accessibility at this location. Therefore, unlike the less-than-significant-with-mitigation impact under the proposed project, the impact of Alternative A on people walking would be ***less than significant***.

Alternatives B, C, D, E, F, and G (Full Preservation/Reduced Program, Full Preservation/Similar Program, and Partial Preservation Alternatives). Alternatives B through G would include similar street network changes within the project site and offsite improvements as under the proposed project (e.g., signalization of the intersections of Illinois Street/23rd Street and Illinois Street/Humboldt Street, sidewalk reconstruction on the east side of Illinois Street between 22nd and 23rd streets) to accommodate pedestrian travel within and adjacent to the project site.

Alternative B would result in about 34 percent fewer person trips compared to the proposed project, while Alternatives C through G would generate a similar number of person trips as the proposed project. Under Alternatives B through G, similar to the proposed project, it is anticipated that the existing and proposed pedestrian-related features would accommodate people walking within the site, and would not result in hazardous conditions or present barriers to people walking to and from the project site. However, similar to the proposed project, the combination of existing conditions at the intersection of Illinois Street/22nd Street, project-generated increases in vehicular travel on Illinois Street, and the large number of people walking between the project site and destinations to the north and west, would result in significant impacts related to pedestrian safety and accessibility. Proposed project Mitigation Measure M-TR-12, Improve Pedestrian Facilities at the Intersection of Illinois Street/22nd Street would also be applicable to Alternatives B through G, and with implementation of this measure, the impacts on people walking, similar to the proposed project, would be ***less than significant with mitigation***.

Bicycle Impacts

Alternative A (No Project/Code Compliant Alternative). Alternative A would not provide bicycle facilities on streets within the project site, however, similar to the proposed project, would provide bicycle lanes on 23rd Street east of Illinois Street and the Planning Code class 1 bikeway along the waterfront. Because the total building area of Alternative A would be about 27 percent of the proposed project and would primarily consist of PDR uses, Alternative A would result in substantially fewer bicycle trips compared to the proposed project. Similar to the proposed project, Alternative A would result in an increase in the number of vehicles, pedestrians, and bicycles in the vicinity of the project site; however, this increase would be substantially less than for the proposed project, and, similar to the proposed project, would not be substantial enough affect bicycle travel or facilities in the area, create potentially hazardous conditions for bicyclists, or interfere with bicycle accessibility. Therefore, similar to the proposed project, the impact of Alternative A on bicycle facilities and circulation would be ***less than significant***.

Alternatives B, C, D, E, F, and G (Full Preservation/Reduced Program, Full Preservation/Similar Program, and Partial Preservation Alternatives). Alternatives B through G would provide a similar street network within the project site as under the proposed project, and proposed bicycle facilities would be similar to the proposed project. The exception would be Alternatives B, C and D which would not include Georgia Lane (which for the proposed project includes class II and

class III bicycle facilities in the northbound and southbound directions, respectively). Alternative B would result in about 34 percent fewer bicycle trips compared to the proposed project, while the number of bicycle trips generated by Alternatives C through G would be similar to the proposed project. Under Alternatives B through G, similar to the proposed project, it is anticipated that the existing, planned, and proposed bicycle facilities in the project vicinity would be well utilized, and it is not expected that the vehicle, bicycle or pedestrian trips associated with these alternatives would result in significant impacts on bicyclists. Therefore, similar to the proposed project, the impacts of Alternatives B through G on bicycle facilities and circulation would be ***less than significant***.

Loading Impacts

Alternative A (No Project/Code Compliant Alternative). Similar to the proposed project, Alternative A would provide onsite (i.e., within buildings) and on-street commercial loading spaces to accommodate the loading demand. Based on the currently anticipated program for Alternative A, the number of commercial loading spaces that would be provided under this alternative would be less than would be provided under the proposed project (i.e., 25 loading spaces for Alternative A, compared to 54 spaces for the proposed project); however, it is anticipated that at the time the buildings are constructed, the number of loading spaces for each building would be determined based on the actual PDR use.

Alternative A would provide substantially fewer square feet of development than the proposed project, however, depending on the type of activity that would occur within the PDR space, the number of delivery/service vehicle trips could be up to the 687 delivery/service vehicle trips per day for the proposed project. The maximum loading demand during the peak hour of loading activities, assuming the higher manufacturing/industrial type uses within the PDR space would be 40 spaces. Because PDR uses that generate a greater commercial loading demand would include additional loading spaces within the building or on-street loading zones adjacent to the proposed uses, the loading demand associated with Alternative A would be accommodated within the project site either within buildings or within the proposed on-street commercial loading zones and would not result in double-parking of trucks within travel lanes or bicycle lanes on adjacent streets such as 23rd Street or Illinois Street, or affect transit and vehicle circulation, or bicyclists or people walking. In addition, similar to the proposed project, Alternative A would include some passenger loading/unloading zones to serve the office uses, albeit fewer than the proposed project. Because Alternative A would provide commercial and passenger loading spaces within the project site to accommodate the commercial and passenger loading demand, loading impacts under this alternative, similar to the proposed project, would be ***less than significant***.

Alternative B (Full Preservation/Reduced Program Alternative). Similar to the proposed project, Alternative B would include onsite and on-street commercial loading spaces and on-street passenger loading/unloading zones to accommodate the loading demand. Because Alternative B would provide less residential and non-residential uses, the number of onsite and on-street commercial loading spaces that would be provided would be less than for the proposed project (i.e., 36 commercial loading spaces for Alternative B, compared to 54 for the proposed project). Similar to

the proposed project, Alternative B would provide on-street passenger loading/unloading zones throughout the project site.

Alternative B would generate 452 daily truck and service vehicle trips compared to 687 for the proposed project. The commercial loading demand during the peak hour of loading activities would also be less than for the proposed project (i.e., peak loading demand of 28 spaces, compared to 42 spaces for the proposed project), and the demand for 28 loading spaces would be accommodated within the 36 on-street and onsite commercial loading spaces, similar to the proposed project. Therefore, the peak commercial vehicle and passenger loading demand associated with Alternative B would be accommodated within the project site without resulting in double-parking of trucks within travel lanes or bicycle lanes, or affect transit, vehicle, bicycle or pedestrian circulation. Because Alternative B would accommodate the commercial and passenger loading demand, loading impacts under this alternative, similar to the proposed project, would be ***less than significant***.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Similar to the proposed project, Alternatives C though G would include on- and off-street commercial loading spaces and on-street passenger loading/unloading zones to accommodate the projected demand for loading spaces. The number of onsite and on-street commercial loading spaces would be the same or similar to the proposed project (i.e., 54 loading spaces for Alternatives C and F, 53 loading spaces for Alternative D, and 52 loading spaces for Alternatives E and G, compared to 54 for the proposed project). Similar to the proposed project, Alternatives C through G would also provide on-street passenger loading/unloading zones throughout the project site.

Alternatives C though G would provide a similar land use program as the proposed project, and would therefore generate a similar number of delivery/service vehicle trips (between 664 and 680 daily delivery/service vehicle trips for Alternatives C though G, compared to 687 for the proposed project). Similar to the proposed project, because the proposed supply of commercial loading spaces would exceed the commercial loading demand during the peak hour of loading operations, the commercial loading demand would be accommodated without resulting in double-parking of trucks within travel lanes or bicycle lanes, or affect transit, vehicle, bicycle or pedestrian circulation. Similar to the proposed project, Alternatives C through G would accommodate the commercial loading and passenger loading/unloading demand, and, similar to the proposed project, loading impacts under these alternatives would be ***less than significant***.

Parking Impacts

Alternative A (No Project/Code Compliant Alternative). Alternative A would provide 784 onsite vehicle parking spaces (1,838 fewer spaces than the proposed project). The vehicle parking demand generated by Alternative A would be 1,652 spaces during the midday period and 374 spaces during the evening period (2,552 and 2,635 spaces less than the proposed project during the midday and evening periods, respectively). Similar to the proposed project, the parking demand during the midday period would not be accommodated onsite; however, because Alternative A would not provide any residential uses and would provide substantially less

commercial office and retail uses, parking demand associated with Alternative A land uses would be accommodated onsite during the evening period. Similar to the proposed project, during the midday period drivers may seek parking elsewhere or change travel modes to transit, walking, bicycling, or other modes, however this would not create hazardous conditions affecting transit, traffic, bicycling, or people walking, or significantly delay transit. Therefore, similar to the proposed project, the impact of Alternative A related to parking would be ***less than significant***.

Alternative B (Full Preservation/Reduced Program Alternative). Alternative B would provide 1,729 onsite vehicle parking spaces (893 fewer spaces than the proposed project), and, similar to the proposed project, Alternative B would include a district parking garage. The vehicle parking demand generated by Alternative B would be 2,814 spaces during the midday period and 1,989 spaces during the evening period (1,391 and 1,020 spaces less than the proposed project during the midday and evening periods, respectively). Similar to the proposed project, the parking demand during both the midday and evening periods would not be accommodated onsite; however, because Alternative B would provide a third less of residential and non-residential uses than the proposed project, the demand that would not be accommodated onsite would be less than for the proposed project. Similar to the proposed project, drivers may seek parking elsewhere or change travel modes to transit, walking, bicycling, or other modes, however this would not create hazardous conditions affecting transit, traffic, bicycling, or people walking, or significantly delay transit. Similar to the proposed project, impacts of Alternative B related to parking would be ***less than significant***.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Alternatives C through G would provide between 37 and 213 fewer onsite vehicle parking spaces than the proposed project, and, similar to the proposed project, these alternatives would include a district parking garage. The vehicle parking demand generated by Alternatives C through G would range between 4,003 and 4,115 spaces during the midday period and between 2,827 and 2,999 spaces during the evening period (between 90 and 200 fewer spaces than the proposed project during the midday period, and between 10 and 182 fewer spaces during the evening period). Similar to the proposed project, the parking demand would not be accommodated onsite, and drivers may seek parking elsewhere or change travel modes to transit, walking, bicycling, or other modes, however this would not create hazardous conditions affecting transit, traffic, bicycling, or people walking, or significantly delay transit. Similar to the proposed project, the impact of Alternatives C through G related to parking would be ***less than significant***.

Emergency Access Impacts

Alternative A (No Project/Code Compliant Alternative). Similar to the proposed project, emergency access to the project site would remain unchanged from existing conditions, and emergency vehicles would continue to access the project site from Third Street and from Illinois Street via 23rd Street, Humboldt Street, and 22nd Street. Under Alternative A, roadways within the project site would be designed to accommodate larger trucks, and therefore, would also accommodate San Francisco Fire Department fire trucks and engines. Alternative A would generate substantially fewer daily vehicle trips than the proposed project, and, similar to the proposed project, this increase in traffic volumes on the surrounding roadways would not

impede or hinder emergency vehicles. Therefore, as with the proposed project, the impacts of Alternative A on emergency access would be ***less than significant***.

Alternatives B, C, D, E, F, and G (Full Preservation/Reduced Program, Full Preservation/Similar Program, and Partial Preservation Alternatives). Under Alternatives B through G, the street network within the project site would be similar to the proposed project, and would be designed to prioritize safe bicycle and pedestrian travel within the site, limit curb cuts into garages and loading facilities, and provide adequate turning radii and sight distances at intersections and driveways. Alternatives B, C and D would not include Georgia Lane, while Alternatives F and G would provide a narrower Georgia Lane with a sidewalk on one side of the street. The internal street network for Alternative E would be the same as for the proposed project. Alternatives B through G would include the new traffic signals at the intersections of Illinois Street/23rd Street and Illinois Street/Humboldt Street. Alternatives B through G would generate fewer daily vehicle trips than the propose project (between 13,045 and 19,256 daily vehicle trips for Alternatives B through G, compared to 19,522 vehicle trips for the proposed project), and, similar to the proposed project, this increase in traffic volumes on the surrounding roadways would not impede or hinder emergency vehicles. Therefore, similar to the proposed project, the impact of Alternatives B though G on emergency access would be ***less than significant***.

Cumulative Impacts

Alternative A (No Project/Code Compliant Alternative). Alternative A would include substantially less land use development on the project site than the proposed project, and would generate substantially fewer trips by all modes than the proposed project. Similar to the proposed project, Alternative A would not contribute considerably to significant 2040 cumulative VMT or regional transit impacts, and therefore the impacts of Alternative A related to cumulative VMT and regional transit would be ***less than significant***.

Unlike the proposed project, Alternative A would not contribute considerably to significant 2040 cumulative Muni transit capacity and transit operations impacts on the 22 Fillmore and 48 Quintara/24th bus routes, and therefore the impacts of Alternative A on cumulative Muni transit capacity and transit operations and transit delay would be ***less than significant.*** Thus, unlike the proposed project, Mitigation Measure M-TR-4, Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Routes, and Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, would not be applicable to this alternative.

In addition, for the same reasons as discussed for the proposed project, 2040 cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts, would be less than significant, and therefore, Alternative A would result in ***less-than-significant*** cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts.

Alternative B (Full Preservation/Reduced Program Alternatives). Alternative B would include about two thirds of the proposed project's land use program, and would generate proportionally fewer trips by all modes than the proposed project. Similar to the proposed project, Alternative B

would not contribute considerably to significant 2040 cumulative VMT or regional transit impacts, and therefore, the cumulative impact of Alternative B on VMT and regional transit would be ***less than significant***.

Alternative B would generate fewer transit trips than the proposed project, and as a result, unlike the proposed project, Alternative B would not contribute considerably to significant Muni transit capacity impacts on the 22 Fillmore route. However, similar to the proposed project, Alternative B would contribute considerably to significant cumulative impacts on the 48 Quintara/24th Street route. Mitigation Measure M-TR-4, Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Routes would be applicable to this alternative. However, similar to the proposed project, because it is not known whether SFMTA would be able to provide additional service on this route, implementation of this measure is uncertain, and the impact on Muni transit capacity would be ***significant and unavoidable with mitigation***. Unlike the proposed project, Alternative B would not contribute considerably to significant cumulative impacts related to Muni transit operations on the 22 Fillmore and 48 Quintara/24th Street routes, and cumulative transit impacts related to travel delay would be ***less than significant***. Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, would not be applicable to this alternative.

For the same reasons as described for the proposed project, 2040 cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts would be less than significant. Therefore, similar to the proposed project, Alternative B would result in ***less-than-significant*** cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts**.**

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Alternatives C through G include a similar land use program as the proposed project, and therefore would generate a similar number of trips by all modes to the proposed project. Similar to the proposed project, Alternatives C through G would not contribute considerably to significant 2040 cumulative VMT or regional transit impacts, and therefore, the impacts of these alternatives on cumulative VMT and regional transit would be ***less than significant***.

Similar to the proposed project, Alternatives C through G would contribute considerably to significant cumulative Muni transit ridership impacts on the 22 Fillmore and 48 Quintara/24th Street bus routes. Like the proposed project, Mitigation Measure M-TR-4, Increase Capacity on the Muni 22 Fillmore and 48 Quintara/24th Street Routes would be applicable to these alternatives. However, similar to the proposed project, because it is not known whether SFMTA would be able to provide additional service on this route, implementation of this measure is uncertain, and the contribution of Alternatives C through G to cumulative Muni transit capacity impacts would be ***significant and unavoidable with mitigation***.

Similar to the proposed project, Alternatives C through G would contribute considerably to significant cumulative Muni transit operations impacts on the 22 Fillmore/Route XX and 48 Quintara/24th Street bus routes. Mitigation Measure M-TR-5, Implement Measures to Reduce

Transit Delay, would also be applicable to these alternatives. However, because it is not certain that implementation of these mitigation measures would reduce enough project-generated vehicles to reduce impacts on the 22 Fillmore/Route XX and 48 Quintara/24th Street bus routes to less-than-significant levels, as with the proposed project, the contribution of Alternatives C through G to cumulative Muni transit operations impacts would be ***significant and unavoidable with mitigation***.

For the same reasons as discussed for the proposed project, cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts would be less than significant. Therefore, similar to the proposed project, Alternatives C though G would result in ***less-than-significant*** cumulative impacts related to traffic hazards, people walking and bicycling, loading, parking, emergency access, and construction-related transportation impacts.

6.D.1.6 Noise and Vibration

Noise impacts of the proposed project are described in Chapter 4, Section 4.F, and as described below, noise impacts of the alternatives would be similar. However, the magnitude of some of the impacts would be less under Alternative A (No Project Alternative/Code Compliant Alternative) and Alternative B (Full Preservation/Reduced Program Alternative). See Section 4.F for a more detailed description of the impacts.

Construction Impacts: Exposure to Noise Levels in Excess of Standards

All alternatives would use the same types of equipment that are proposed to be used for the proposed project. Like the proposed project, operation of some types of construction equipment under all alternatives would also be expected to exceed the City's noise ordinance threshold limit for equipment (86 dBA at 50 feet) and implementation of Mitigation Measure M-NO-1, Construction Noise Control Measures, would be required under all alternatives. Therefore, the impact related to noise generated by operating equipment in excess of the ordinance threshold limit for all alternatives, like the proposed project, would be ***less than significant with mitigation***.

Nighttime construction activities (primarily surface preparation, foundation construction, and building construction) could occur under all alternatives[3] and noise generated by these activities could exceed the City's "Ambient + 5 dBA" threshold limit for nighttime construction. If nighttime noise levels exceed this nighttime noise limit, section 2908 would require that a special permit be obtained from the City to ensure that the project would meet section 2908 ordinance requirements are met under all alternatives.

[3] All alternatives except Alternatives A and B would have the same phasing schedule as the proposed project. Alternatives A and B would involve less extensive development than other alternatives, and the estimated phasing schedule would be commensurately shorter. Therefore, it is possible that nighttime construction could still occur under these alternatives.

Construction Impacts: Increase in Ambient Noise Levels at Sensitive Receptors

When compared to the proposed project, overall noise impacts resulting from construction-related noise increases under Alternatives A and B would be reduced, while Alternatives C through G would be similar. The site boundaries under Alternatives B through G would be the same as the proposed project, but under Alternative A (No Project/Code Compliant Alternative), the PG&E sub-area (proposed Block 13) would not be included and therefore, project-related construction activities would be located farther away from the closest existing offsite receptors to the west. When compared to the proposed project's 15-year construction duration, Alternative A would have a substantially shorter construction duration of seven years (2020 to 2026), while Alternative B would have a slightly shorter duration of 11 years (2020 to 2034). Alternatives C through G would have the same 15-year construction duration as the proposed project.

Alternative A (No Project/Code Compliant Alternative). Although Alternative A's construction duration would be substantially shorter than the proposed project's, future residents located on Pier 70's Parcels F/G could still be exposed to construction-related noise increases (for three years compared to 12 years under the proposed project). With the shorter duration and less pile driving required, the magnitude of this impact would be less than the proposed project. However, similar construction equipment would likely be used to construct new development and therefore, operation of construction equipment under this alternative would have the same potential to exceed both the Federal Transit Administration's limit of 90 dBA at sensitive receptor locations and the applicable "Ambient + 10 dBA" threshold as the proposed project. Therefore, this impact would still be *less than significant* at existing offsite receptors, like the proposed project. There would be no onsite residential uses developed on the project site under Alternative A; therefore, construction-related noise impacts on future onsite receptors would be avoided altogether (*no impact* under Alternative A versus *significant and unavoidable with mitigation* under the proposed project). Construction phases under Alternative A and Pier 70 would still overlap, and there would continue to be *significant and unavoidable with mitigation* noise impacts on future residents at Pier 70's Parcels F/G under this alternative. With implementation of noise controls during all construction phases as specified in Mitigation Measure M-NO-1, Construction Noise Control Measures, the severity of noise impacts on the closest Pier 70 receptors on Parcels F/G under Alternative A would be less than the proposed project due to the shorter construction duration and less pile driving required. However, because the feasibility of quieter, alternative pile driving methods under this alternative cannot be determined at this time, the potential would still exist that combined noise levels from simultaneous operation of the noisiest types of construction equipment could still exceed the "Ambient + 10 dBA" threshold. Given this uncertainty, this impact would still conservatively be ***significant and unavoidable with mitigation*** (even with implementation of Mitigation Measure M-NO-1) like the proposed project, even though the magnitude of the residual impact would be substantially less under this alternative than under the proposed project.

Alternative B (Full Preservation/Reduced Program Alternative). With fewer residential receptors proposed and shorter construction duration under Alternative B, overall noise impacts on existing offsite receptors, future onsite receptors, and planned offsite receptors would be less than the proposed project. However, significance determinations are expected to be the same as the proposed project – *less than significant* for existing offsite receptors and ***significant and unavoidable***

with mitigation (even with implementation of Mitigation Measure M-NO-1) for future onsite receptors and planned offsite receptors.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Site boundaries and construction durations under Alternatives C through G would be the same as the proposed project, and estimated combined noise levels at the closest existing offsite receptors under these alternatives would be the same as the proposed project. Therefore, like the proposed project, construction-related noise increases at existing offsite receptors would be *less than significant* under Alternatives C through G. In addition, since these alternatives would include development of residential uses on the project site with the same phasing schedule as the proposed project, impacts and significance determinations under these alternatives are expected to be the same as the proposed project – ***significant and unavoidable with mitigation*** (even with implementation of Mitigation Measure M-NO-1) for future onsite receptors and planned offsite receptors.

Construction Impacts: Offsite Haul Truck Traffic Noise

Construction-related haul and vendor truck traffic increases on local access streets would be less than the proposed project under Alternatives A and B and similar to the proposed project under Alternatives C through G. This impact was determined to be *less than significant* for the proposed project, and likewise, it would also be ***less than significant*** for all alternatives. However, it is still recommended that Improvement Measures I-NO-A, Avoidance of Residential Streets, and Improvement Measure I-TR-A, Construction Management Plan and Public Updates be implemented under all alternatives in order to minimize potential disturbance of residents in the Dogpatch neighborhood from the construction-related truck noise increases under all alternatives and the combined truck noise increases resulting from the overlapping construction schedules of all alternatives and Pier 70.

Construction Impacts: Vibration

Alternative A (No Project/Code Compliant Alternative). Alternative A would not include a recreational dock, and therefore, unlike the proposed project, vibratory pile drivers would not be required, and construction-related vibration impacts on existing structures due to use of vibratory pile drivers would be *less than significant* and Mitigation Measure M-NO-4c, Vibration Control Measures During Use of Vibratory Equipment, would not be required under this alternative. Additionally, there would be less pile driving under this alternative if deep foundations are not required. With a much shorter construction duration, it is possible that any limited pile driving or controlled blasting required along the northern site boundary could be completed prior to or during construction of adjacent Pier 70 buildings on Parcels F/G. Although this impact could be avoided altogether under this alternative, it is still possible that any required pile driving along the northern boundary might occur during or after construction of Pier 70 buildings on along the northern boundary, and therefore, implementation of Mitigation Measures M-NO-4a, Construction Vibration Monitoring, and M-NO-4b, Vibration Control Measures During Pile Driving and Controlled Blasting, would still be required under this alternative to reduce impacts on onsite and offsite historic resources and offsite structures to the north to a less-than-significant level. Therefore,

construction-related vibration impacts on planned structures under Alternative A, like the proposed project, would be ***less than significant with mitigation***.

Alternatives B, C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Alternatives B through G would have the same site boundaries and general building locations as the proposed project and all alternatives would include a recreational dock. Additionally, the proximity of the closest existing historic and planned offsite structures on the Pier 70 site would be the same as under the proposed project. Therefore, construction-related vibration impacts would be the same as the proposed project and vibration levels could exceed established thresholds. Proposed pile driving and controlled blasting associated with controlled rock fragmentation under these alternatives would require implementation of Mitigation Measure M-NO-4a, Construction Vibration Monitoring, Mitigation Measure M-NO-4b, Vibration Control Measures During Use of Vibratory Equipment, and Mitigation Measure M-NO-4c, Vibration Control Measures During Pile Driving and Controlled Blasting, to reduce impacts on the existing structure to the south and planned structures to the north, including onsite and offsite historic resources, to a less-than-significant level. Therefore, construction-related vibration impacts on existing and planned structures under Alternatives B through G, like the proposed project, would be ***less than significant with mitigation***.

These alternatives, however, could damage existing onsite structures that are designated for preservation, in contrast to the proposed project where all existing onsite structures would be demolished, with the exception of the Boiler Stack and possibly the Unit 3 Boiler. The degree of potential impact would depend on whether the buildings to be preserved are retrofitted before or after proposed vibration-generating construction activities such as pile driving and controlled blasting (these generate the highest vibration levels). This analysis assumes that historic structures would be retrofitted prior to these activities. Therefore, it would be feasible to maintain vibration levels below the 0.5 in/sec PPS threshold level if pile driving and controlled blasting activities were to not occur within approximately 90 feet of these structures (no mitigation). However, construction could occur as close as 10 to 30 feet with implementation of lower vibration-generating techniques (see Table 4.F-12, low end of the range for pile driving and controlled blasting). If historic structures to be retained were not retrofitted prior to pile driving and controlled blasting activities, a lower threshold of 0.2 in/sec PPV would be more appropriate to apply, and pile driving or controlled blasting could require relatively greater setbacks of up to 250 feet. However, with the use of lower vibration-generating techniques, pile driving and controlled blasting could occur as close as approximately 25 feet. Since setback distances and the condition of the structures to be retained at the time of construction are unknown, this impact is considered to be potentially significant. However, limiting charge sizes or using other controlled rock fragmentation techniques, as required in Mitigation Measures M-NO-4a, Construction Vibration Monitoring, and M-NO-4b, Vibration Control Measures During Pile Driving and Controlled Blasting, plus implementation of Mitigation Measure M-CR-5e, Historic Preservation Plan and Review Process for Alteration of the Boiler Stack, would reduce this potential impact to a less-than-significant level, and like the proposed project, this impact would be ***less than significant with mitigation***.

Operational Impacts: Exposure to Noise Levels in Excess of Standards

Operation of the proposed project would increase ambient noise levels on and near the project site from the onsite use of stationary equipment (i.e., heating/ventilation/air conditioning systems and emergency generators) and from the introduction of noise-generating uses on the project site such as rooftop uses and open space activities. These noise sources would be present under all of the alternatives, although the extent of such equipment may be less under Alternatives A and B. Implementation of noise control measures in the design of mechanical equipment, as specified in Mitigation Measure M-NO-5, Stationary Equipment Noise Controls, would reduce potential noise conflicts to a less-than-significant level. Therefore, like the proposed project, for Alternatives A through G, these impacts would be ***less than significant with mitigation***.

Operational Impacts: Exposure to Noise Levels from Events that include Outdoor Amplified Sound

Development of public open spaces would introduce new uses such as: assembly and entertainment spaces for temporary events, spill-out spaces for retail or outdoor dining, quiet spaces, waterfront viewing terraces, playgrounds, and soccer fields. These active/passive recreational activities (including soccer fields and rooftop recreational facilities) would not involve large crowds and would be subject to noise ordinance limits. Proposed temporary events could involve the use of outdoor amplified sound. Performances, fairs, weddings, or any events held in open space areas and involving amplified sound would have the potential to cause a 10-dBA noise increase (generally perceived as a doubling of loudness) above future onsite ambient noise levels. All seven alternatives would include open space uses similar to the proposed project. Therefore, this same impact could occur under all alternatives, and like the proposed project, compliance with noise limits established under the Police and Health codes (which limits residential interior noise levels to 45 dBA or less between 10 p.m. and 7 a.m.), time restrictions (i.e., amplified sound cannot be audible at 50 feet from the property line after 10 p.m.), and other permit requirements specified in sections 49 and 1060 of the Police Code would ensure that periodic and temporary noise increases from amplified sound associated with such events would be ***less than significant***.

Operational Impacts: Exposure to Noise Levels from Rooftop Bars and Restaurants

Like the proposed project, rooftops of any non-residential buildings under all alternatives could be developed with bars and restaurants and these uses could include playing of amplified music in outdoor areas during the evening/nighttime hours. However, like the proposed project, compliance with noise limits established under the Police and Health codes (which limits residential interior noise levels to 45 dBA or less between 10 p.m. and 7 a.m.), time restrictions (i.e., amplified sound cannot be audible at 50 feet from the property line after 10 p.m.), and other permit requirements specified in sections 49 and 1060 of the Police Code would ensure that periodic and temporary noise increases from amplified sound at rooftop bars and restaurants would be ***less than significant*** under all alternatives.

Operational Impacts: Offsite and Onsite Traffic Noise Increases

The proposed project would result in significant traffic noise increases (increases would be more than 5 dBA) along three street segments east of Illinois Street, on the western portion of the project site (22nd Street, Humboldt Street, and 23rd Street) as well as the segments of 22nd Street and 23rd Street between Third and Illinois streets, west of the project site. Likewise, operation of all alternatives would result in permanent increases in traffic and associated noise levels along roadways in the project vicinity.

Alternative A (No Project/Code Compliant Alternative). As shown in Table 6-4, above, Alternative A would generate only about one third (34 percent) of the daily vehicle trips that would be generated by the proposed project, which would substantially reduce project-related noise increases along some roadway segments. Assuming this estimated reduction in vehicle trip generation would occur along street segments that would be significantly affected by the proposed project, Alternative A could reduce the number of significantly affected road segments from five under the proposed project to one (Humboldt Street east of Illinois). However, even with implementation of Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, traffic noise increases would still be significant on this one remaining segment even with any vehicle trip reductions that result from this measure. Therefore, traffic noise increases under Alternative A would be substantially reduced from the proposed project but could still be ***significant and unavoidable with mitigation.***

Under the proposed project, the only uses considered to be sensitive to noise would be residential, hotel, and childcare uses and future noise levels along the sections of 22nd Street, Humboldt Street, and 23rd Street east of Illinois and along the section of Illinois Street adjacent to the project site were determined to be conditionally acceptable for these uses. For the proposed project, implementation of Mitigation Measure M-NO-8, Design of Future Noise-Sensitive Uses, would reduce this significant impact to a less-than-significant level, and the impact was determined to be *less than significant with mitigation*. When compared to the proposed project, Alternative A would avoid this impact because no residential, hotel, or childcare uses would be developed on the project site. Therefore, unlike the proposed project, there would be *no impact* under Alternative A to onsite sensitive receptors, although as described in the preceding paragraph, impacts to offsite sensitive receptors would still be significant and unavoidable with mitigation.

Alternative B (Full Preservation/Reduced Program Alternative). As shown in Table 6-4 above, Alternative B would generate about two-thirds (67 percent) of the proposed project's daily vehicle trips, which would reduce substantially reduce project-related noise increases along some roadway segments. Assuming this estimated reduction in vehicle trip generation would occur along street segments that would be significantly affected by the proposed project, Alternative B could reduce the number of significantly affected road segments from five under the proposed project to four (only the increase on the segment of 22nd Street between Third and Illinois would decrease to less than 5 dBA). However, even with implementation of Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, traffic noise increases would still be significant on at least two, if not all four, of the remaining segments even with any vehicle trip reductions that result from this measure. Therefore, traffic noise increases under Alternative B would be

reduced slightly from the proposed project but would still be ***significant and unavoidable with mitigation***.

Alternative B would include residential, hotel, and childcare uses and despite the modest decrease in onsite traffic noise levels under this alternative, future noise levels would still be conditionally acceptable for residential, hotel, and childcare uses on the project site under this alternative. Mitigation Measure M-NO-8, Design of Future Noise-Sensitive Uses, would be required to reduce this significant impact to a less-than-significant level. Therefore, like the proposed project, impacts to onsite sensitive receptors would be *less than significant with mitigation* under Alternative B, although as described in the preceding paragraph, impacts to offsite sensitive receptors would still be *significant and unavoidable with mitigation*.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Alternatives C through G would generate approximately the same level of vehicle trips as the proposed project (97 to 99 percent). Therefore, no reduction in traffic noise would occur under these alternatives. The significance of this impact and requirement of Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delay, under these alternatives would be the same as the proposed project, and would be ***significant and unavoidable with mitigation***.

Alternatives C through G would include residential, hotel, and childcare uses and despite the modest decrease in onsite traffic noise levels under Alternative B, future noise levels would still be conditionally acceptable for residential and childcare uses on the project site under all of these alternatives. Mitigation Measure M-NO-8, Design of Future Noise-Sensitive Uses, would be required to reduce this significant impact to a less-than-significant level. Therefore, like the proposed project, impacts to onsite sensitive receptors would be *less than significant with mitigation* under Alternatives C through G, although as described in the preceding paragraph, impacts to offsite sensitive receptors would still be *significant and unavoidable with mitigation*.

Cumulative Impacts: Construction

Concurrent construction of the proposed project, the adjacent Pier 70 Mixed-Use District project, and other cumulative development in the area would have the potential to result in cumulative noise increases at the closest residential receptors to the project site. For the proposed project, cumulative construction-related noise increases from concurrent construction activities and construction-related traffic were determined not to exceed the "Ambient + 10 dBA" threshold or Federal Transit Administration's limit of 90 dBA at the closest existing offsite sensitive receptor locations, but could exceed these thresholds at certain future planned offsite and proposed onsite receptors. Even with implementation of Mitigation Measure M-NO-1, Construction Noise Control Measures, it was determined that cumulative construction noise impacts would be *significant and unavoidable with mitigation*. Alternatives A and B would have a shorter construction duration than the proposed project, while Alternatives C through G would have a construction phasing schedule that would be the same as the proposed project. Therefore, like the proposed project, the potential for cumulative construction-related noise increases to result from concurrent construction would be less than the proposed project under Alternatives A and B, and it would be the same as the proposed project under Alternatives C through G. Therefore, like the proposed project, cumulative

construction noise increases would be ***significant and unavoidable with mitigation*** under all alternatives, although impacts under Alternatives A and B would be less in magnitude than those under the project while impacts under Alternatives C through G would be about the same as the project.

Cumulative Impacts: Operation

Traffic noise increases related to cumulative development in the area (including the proposed project and Pier 70 project) would result in cumulative traffic noise increases of up to 20.7 dBA (L_{dn}) when compared to existing traffic noise levels on streets segments in the project vicinity. Based on the significance thresholds for traffic noise increases, these cumulative traffic noise increases on 26 street segments (listed in Section 4.F) would be a cumulatively significant impact because cumulative development would result in substantial permanent increases in existing noise levels.

Alternative A (No Project/Code Compliant Alternative). As indicated above, Alternative A would generate about one-third (34 percent) the level of traffic generated by the proposed project and would thereby contribute proportionately less to cumulative traffic noise increases. The reduction would be sufficient to reduce cumulative traffic noise increases to a less-than-significant level on approximately 11 of the 26 street segments. As noted above under Transportation and Circulation, Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delays, would not be warranted for transit operations impacts under Alternative A, but it would be warranted insofar as it would reduce vehicle trips and associated noise increases along roadways. Regardless of whether this mitigation measure were implemented or not, this alternative would still result in a considerable contribution to this cumulative impact on 15 street segments, and like the proposed project, would be a ***significant and unavoidable impact with mitigation***.

Alternative B (Full Preservation/Reduced Program Alternative). Alternative B would generate about two-thirds (67 percent) of the proposed project's daily vehicle trips, which would reduce the alternative's contribution to cumulative traffic noise increases. Alternative B would reduce cumulative traffic noise to a less-than-significant level on approximately 5 of the 26 street segments. Implementation of additional trip reduction measures required in Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delays, could further reduce traffic noise increases to a less-than-significant level on additional street segments. However, the effectiveness of this mitigation measure and the resulting level of traffic noise reduction is unknown. Therefore, Alternative B would still result in a considerable contribution to this cumulative impact, and although this impact would be less than with the proposed project, it would be ***significant and unavoidable impact with mitigation***.

Alternatives C, D, E, F, and G (Full Preservation/Similar Program and Partial Preservation Alternatives). Since Alternatives C through G would generate the same level of traffic as the proposed project, traffic noise increases under these alternatives would be the same as the proposed project. Implementation of additional trip reduction measures required in Mitigation Measure M-TR-5, Implement Measures to Reduce Transit Delays, could reduce significant traffic

noise increases to a less-than-significant level, the effectiveness of this mitigation measure and the resulting level of traffic noise reduction is unknown. Therefore, like the proposed project, Alternatives C through G would result in a considerable contribution to this cumulative impact, a ***significant and unavoidable impact with mitigation***.

6.D.1.7 Air Quality

Air quality impacts of the proposed project are described in Chapter 4, Section 4.G, and as described below, air quality impacts of the alternatives would be similar. See Section 4.G for more detailed description of the proposed project's impacts.

Construction Impacts: Fugitive Dust Emissions

As with the proposed project, construction activities under all alternatives would be required to comply with the Construction Dust Control Ordinance, and to implement specified dust control measures. Building permits would not be issued without written notification from the Director of Public Health that states that the applicant has a site-specific Dust Control Plan. The Construction Dust Control Ordinance requires the project sponsor and the contractors who are responsible for construction activities to minimize visible dust by: watering all construction areas sufficiently to prevent dust from becoming airborne; providing as much water as necessary to control dust in any area of land clearing, earth movement, excavation, drillings, and other dust-generating activity; during excavation and earth-moving activities, wet sweeping or vacuuming the streets, sidewalks, paths, and intersections where work is in progress at the end of the workday; covering any inactive stockpiles greater than 10 cubic yards or 500 square feet of excavated materials, and using dust enclosures, curtains, and dust collectors as necessary to control dust in the excavation area. These measures would be applicable under any of the seven alternatives considered. Compliance with the regulations and procedures set forth by the Construction Dust Control Ordinance would ensure that like the proposed project, potential dust related air quality impacts for Alternatives A through G would be ***less than significant***.

Construction and Overlapping Operational Impacts: Criteria Air Pollutant Emissions

As described in Chapter 4, Section 4.G, Air Quality, criteria air pollutant emissions during project construction and overlapping operations would be significant and unavoidable even with implementation of Mitigation Measures M-AQ-2a (Construction Emissions Minimization), M-AQ-2b (Diesel Backup Generator Specifications), M-AQ-2c (Promote Use of Green Consumer Products), M-AQ-2d (Electrification of Loading Docks), M-TR-5 (Implement Measures to Reduce Transit Delay), M-AQ-2e (Additional Mobile Source Control Measures), and M-AQ-2f (Offset Construction and Operational Emissions). Specifically, emissions of ozone precursors (reactive organic gases, ROG, and oxides of nitrogen, NOx) would exceed significance thresholds, even with mitigation. As shown in Section 4.G, Tables 4.G-7A and 4.G-7B, the highest mitigated construction-related emissions of ROG was estimated to be 94 pounds per day (lb/day) for the proposed project, which would occur during the Phase 6 construction and concurrent operation of Phases 1 through 5, which are conservatively assumed to be occupied at that time. As shown in Table 4.G-7, mitigated

emissions of NOx for the proposed project reached a maximum of 88 lb/day during the construction of Phases 4, 5, and 6 and concurrent operation of Phases 1 through 3.

For each alternative, the reduction in ROG and NOx emissions compared to the proposed project can be roughly correlated to the reduction in square footage constructed (see Table 6-1, above, for total building area of each alternative as a percentage of the building area for the proposed project). However, the difference in construction duration and phasing for the proposed project and each alternative is also considered. **Table 6-5, Unmitigated and Mitigated Maximum Average Daily Construction Emissions for the Project and Alternatives,** presents an estimate of the maximum mitigated and unmitigated ROG and NOx emissions during construction with overlapping operations for each alternative.

Alternative A (No Project/Code Compliant Alternative). For Alterative A, the gross square footage would be 27 percent of the building area of the proposed project, as shown in Table 6-1. A reduction in ROG emissions can be correlated to the building square footage reduction because ROG emissions are largely due to construction equipment activity and off-gassing of asphalt and paint. Reducing emissions of ROG to 27 percent of the maximum unmitigated project emissions of 103 lb/day results in emissions of approximately 28 lb/day, which would be below significance thresholds. Since emissions for Alternative A occur over a shorter time frame (seven years compared to 15 years for the proposed project), daily ROG emissions may be higher than the estimated 28 lb/day during any particular year; however, ROG emissions are still expected to be below significance thresholds under Alternative A.[4] For NOx, a reduction to 34 percent (which correlates to the external daily vehicle reduction and therefore the construction equipment activity largely responsible for the NOx emissions) would result in NOx emissions of 70 lb/day, thus exceeding the 54 lb/day threshold. Therefore, it is likely that mitigation would still be required for Alternative A. With implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, construction-related emissions of NOx and ROG would be less than significant. Thus, unlike the proposed project, construction impacts related to criteria air pollutant emissions under Alternative A would be ***less than significant with mitigation***, a substantial reduction in the significant and unavoidable construction impact identified for the proposed project.

Alternative B (Full Preservation/Reduced Program Alternative). For Alterative B, the gross square footage would be 66 percent of the building area of the proposed project, as shown in Table 6-1. For ROG, reduction of emissions to 66 percent of the maximum unmitigated emissions of 103 lb/day results in emissions of approximately 69 lb/day, which would still exceed significance thresholds. For NOx, a reduction to 66 percent (which correlates to the building square footage reduction and therefore the construction equipment activity which drives NOx emissions) would result in NOx emissions of 137 lb/day, exceeding thresholds. Therefore, mitigation would be required for Alternative B. As shown in Table 6-5, with implementation of Mitigation Measures M-AQ-2a, Construction Emissions Minimization, construction-related emissions of ROG and NOx would be 63 and 58 lb/day, respectively, still exceeding significance thresholds. Thus, like the proposed project,

[4] A seven-year time period is 2.14 times shorter than a 15-year period. Accounting for this compressing of emissions into a shorter time period would result in 25 lb/day x 2.14 = 53.6 lb/day ROG, which is still less than the 54-lb/day threshold.

TABLE 6-5
UNMITIGATED AND MITIGATED MAXIMUM AVERAGE DAILY CONSTRUCTION EMISSIONS FOR THE PROJECT AND ALTERNATIVES, INCLUDING OVERLAPPING CONSTRUCTION AND OPERATION

	Average Daily Emissions (lb/day)*	
	ROG	NOx
Significance Thresholds	**54**	**54**
Proposed Project		
Maximum Daily Unmitigated Emissions	103	206
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	94	88
Significant?	Yes	Yes
Alternative A, No Project/Code Compliant Alternative		
Maximum Daily Unmitigated Emissions	28	70
Significant?	No	Yes
Maximum Daily Mitigated Emissions	25	30
Significant?	No	No
Alternative B, Full Preservation/Reduced Program Alternative		
Maximum Daily Unmitigated Emissions	69	137
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	63	58
Significant?	Yes	Yes
Alternative C, Full Preservation/Similar Program Alternative		
Maximum Daily Unmitigated Emissions	102	204
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	93	87
Significant?	Yes	Yes
Alternative D, Partial Preservation 1 Alternative		
Maximum Daily Unmitigated Emissions	97	194
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	89	82
Significant?	Yes	Yes
Alternative E, Partial Preservation 2 Alternative		
Maximum Daily Unmitigated Emissions	100	200
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	92	85
Significant?	Yes	Yes
Alternative F, Partial Preservation 3 Alternative		
Maximum Daily Unmitigated Emissions	98	196
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	90	83
Significant?	Yes	Yes
Alternative G, Partial Preservation 4 Alternative		
Maximum Daily Unmitigated Emissions	99	198
Significant?	Yes	Yes
Maximum Daily Mitigated Emissions	91	84
Significant?	Yes	Yes

* Note that values derived from data presented in this table may not exactly match due to rounding.

SOURCE: Ramboll, 2018. See Appendix E.

additional mitigation measures, including Mitigation Measure M-AQ-2a through 2f and M-TR-5, would be required, including a requirement for the project sponsor to provide for offset emissions to reduce ROG and NOx levels to below the significance thresholds. Therefore, while construction impacts related to criteria air pollutant emissions under Alternative B would be approximately one third less than that of the proposed project, the impact would still be ***significant and unavoidable with mitigation***, but the amount of emissions offset required under Mitigation Measure M-AQ-2f would be commensurately lower.

Alternatives C, D, E, F, and G (Full and Partial Preservation Alternatives). Building area development under Alternatives C, D, E, F, and G would be reduced marginally, with gross square footage of development ranging from 94 to 99 percent of the proposed project, as shown in Table 6-1. As shown in Table 6-5, like the proposed project, all five of these alternatives would exceed emissions thresholds for ROG and NOx both with and without mitigation, albeit with a slight reduction in emissions compared to that of the project, and Mitigation Measures M-AQ-2a through M-AQ-2f and M-TR-5 would apply to all of these alternatives. Consequently, like the proposed project, the construction-related air quality impacts with regard to criteria air pollutants of Alternatives C, D, E, F, and G would be ***significant and unavoidable with mitigation***.

Operational Impacts: Criteria Air Pollutant Emissions

For the proposed project, the estimated unmitigated operational emissions of ROG and NOx would be 105 and 102 lb/day, respectively, exceeding significance thresholds. With mitigation, these would be reduced to 101 and 85 lb/day, respectively, still exceeding significance thresholds. PM_{10} and $PM_{2.5}$ emissions for the proposed project would be below significance thresholds for both the unmitigated and mitigated scenarios. Based on ROG and NOx emissions, the impact associated with operational criteria pollutant emissions for the proposed project was found to be significant and unavoidable with mitigation.

Alternative A (No Project/Code Compliant Alternative). Alternative A would result in substantially lower vehicle trip generation and less total square footage of development compared to the proposed project and, consequently, would have lower operational emissions. Specifically, Alternative A would only generate approximately 34 percent of the vehicle trips relative to the proposed project. Since operational NOx emissions are primarily due to mobile source emissions, this reduction in vehicle trips would result in a large reduction of NOx emissions to approximately 34 percent of the proposed project emissions (i.e., 34 percent x 102 lb/day = 35 lb/day NOx), which is below the significance threshold. Similarly, Alternative A would construct only approximately 27 percent of the total proposed project square footage. Since ROG emissions are primarily due to area sources, this reduction in gross square footage would result in a reduction of ROG emissions to below significance thresholds (i.e., 27 percent x 105 lb/day = 28 lb/day ROG). PM_{10} and $PM_{2.5}$ emissions would also be reduced under Alternative A compared to the proposed project, and would, therefore, remain below significance thresholds. As a result, the operation impact of Alternative A criteria air pollutant emissions at full buildout is considered ***less than significant.*** Alternative A would substantially reduce the significant and unavoidable operational impact from criteria air pollutants that is identified for the proposed

project. None of the mitigation measures identified for operational impacts would be required under Alternative A. In addition, it should be noted that under this alternative building heights would be reduced to the extent that backup diesel generators would not be required for any buildings, which would reduce operational emissions.

Alternative B (Full Preservation/Reduced Program Alternative). Alternative B would construct approximately one-third less square footage of development than the proposed project. The largest portion of ROG emissions are from area sources, which directly correlate to square footage. Therefore, ROG emissions under Alternative B would be roughly one-third less than ROG emissions from the proposed project, or 70 lb/day (two-thirds x 105 lb/day = 70 lb/day). Even with this reduced program under Alternative B, unmitigated operational ROG emissions would still exceed the significance threshold and mitigation would be required. Alternative B would generate roughly one-third fewer vehicle trips than the proposed project. Additionally, Alternative B would have fewer emergency generators than the proposed project, which are the second largest contributor to NOx emissions. Therefore, NOx emissions for Alternative B would be roughly one-third less than emissions from the proposed project. Unmitigated operational NOx emissions of Alternative B would result in emissions of 68 lb/day (two-thirds x 102 lb/day = 68 lb/day). Unmitigated operational NOx emissions would still exceed the significance threshold and mitigation would be required. With implementation of Mitigation Measures M-AQ-2a through M-AQ-2f and M-TR-5, operational emissions of ROG and NOx would be 67 lb/day and 56 lb/day, respectively, and therefore the impact would remain significant and unavoidable. Thus, like the proposed project, operational impacts related to criteria air pollutant emissions under Alternative B would be ***significant and unavoidable with mitigation***, but about one third less severe than under the project.

Alternatives C, D, E, F, and G (Full and Partial Preservation Alternatives). Alternatives C through G would result in slightly fewer vehicle trips than the proposed project (roughly 97 – 99 percent of the proposed project) and, consequently, would have only marginal reductions in operational emissions of criteria air pollutants. This very slight reduction in vehicle trips would not result in a considerable reduction in ROG and NOx emissions after full buildout of Alternatives C through G. Therefore, like the proposed project, both unmitigated and mitigated operational emissions of ROG and NOx under Alternatives C, D, E, F, and G would be expected to exceed significance thresholds, and this impact would be ***significant and unavoidable with mitigation***. The same mitigation measures identified for the proposed project—Mitigation Measures M-AQ-2c, M-AQ-2d, M-AQ-2e, M-TR-5, and M-AQ-2f— would apply to Alternatives C through G, although there could be a slight reduction in operational emissions of criteria air pollutants and the amount of offset operational emissions under Mitigation Measure M-AQ-2f would vary slightly.

Toxic Air Contaminants, Construction and Operation

Construction and operation of the proposed project would generate toxic air contaminants, including diesel particulate matter, which could expose both offsite and onsite sensitive receptors to a localized health risk. Table 4.G-10 in Section 4.G, Air Quality, shows the lifetime cancer risk and $PM_{2.5}$ concentrations of the proposed project at offsite sensitive receptors under both unmitigated and mitigated conditions, and Table 4.G-11 shows similar results for onsite

receptors. For offsite receptors, lifetime cancer risk for the proposed project was found to be less than significant with mitigation; the unmitigated risk at the residential and daycare receptors located at Pier 70 was found to be 419 in a million, but was reduced to 63 in a million with mitigation. $PM_{2.5}$ concentrations from the proposed project at all offsite receptor locations would be below significance thresholds for construction and operation under unmitigated conditions.

For onsite receptors, lifetime cancer risk for the proposed project was found to be less than significant with mitigation; the unmitigated risk at the maximum onsite receptor was found to be 387 in a million, but was reduced to 77 in a million with mitigation. Therefore, implementation of Mitigation Measure M-AQ-2a would reduce the lifetime cancer risk to onsite receptors to less than significant with mitigation. $PM_{2.5}$ concentrations from the proposed project at onsite receptor locations would be below significance thresholds for construction and operation without mitigation.

For all alternatives, the same offsite and onsite receptors as identified for the proposed project are analyzed.

Excess Cancer Risk to Offsite Receptors

Alternative A (No Project/Code Compliant Alternative). Similar to the proposed project, construction and operation of Alternative A would generate toxic air contaminants, including diesel particulate matter. However, as discussed above, Alternative A would result in only approximately 27 percent of the square footage of development of the proposed project, and the reduction in construction-related diesel particulate matter emissions are expected to roughly correlate with the reduction in square footage. Similarly, Alternative A would generate fewer vehicle trips than the proposed project, and building heights would be reduced to less than 40 feet, which would eliminate the need for backup diesel generators for all buildings; therefore, Alternative A would result in less operational emissions of diesel particulate matter. While it cannot be determined definitively that development under Alternative A would be significant without mitigation without a full quantitative health risk assessment, given that the risk values for the project would still be significant if the contribution from project construction and operation were reduced to 27 percent of those of the proposed project, it is likely that increased cancer risk would be significant in the absence of mitigation. Based on the reduced square footage of construction compared with the proposed project, reducing the contribution to cancer risk from unmitigated project construction and operation by 27 percent is 136 in one million, which exceeds the threshold of significance.[5] However, with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, lifetime cancer risk to offsite receptors under Alternative A would be lower than that of the proposed project due to less construction activity. Unlike the proposed project, Mitigation Measure M-AQ-2b, Diesel Backup Generator Specifications, would not be required under this alternative because building heights would be reduced to the extent that backup diesel generators would not be required for any buildings. Therefore, with mitigation, Alternative A would not result

[5] The contribution from unmitigated project construction and operation is 388 in a million. Twenty-seven percent of 388 in a million is 105 in a million. The background contribution remains at 31 in a million. Thus, the estimated resulting cancer risk is 105 + 31 = 136 in one million.

in offsite sensitive receptor locations meeting the Air Pollutant Exposure Zone criterion for cancer risk, and impacts related to construction and operational exposure to toxic air contaminants would be ***less than significant with mitigation***.

Alternative B (Full Preservation/Reduced Program Alternative). Similar to Alternative A, this analysis also holds for Alternative B, where the square footage of development would be 66 percent of the proposed project's (one third less), which would correlate with a reduction in construction emissions. Additionally, Alternative B would result in less diesel particulate matter emissions compared to the proposed project because fewer emergency generators would be required with this reduced development. Reducing the unmitigated cancer risk by one-third for Alternative B would still result in a cancer risk above significance thresholds at offsite receptors at Pier 70 and would require mitigation; however, actual results would depend somewhat on phasing and location of Alternative B construction. Under Alternative B, like the proposed project, implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, would reduce the risk to offsite receptors to less than significant. Therefore, with mitigation Alternative B would not result in offsite sensitive receptor locations meeting the Air Pollutant Exposure Zone criterion for cancer risk, and impacts related to construction and operational exposure to toxic air contaminants would be ***less than significant with mitigation***.

Alternatives C, D, E, F, and G (Full and Partial Preservation Alternatives). Reductions in the building area under Alternatives C, D, E, F, and G would be marginal, with development ranging from 94 to 99 percent of the proposed project, and the nearest offsite receptors on the Pier 70 site would be the same distance from construction activities on Blocks 1, 2, and 3 as the proposed project. Therefore, the impact of these alternatives with respect to cancer risk at offsite receptors would be the same as under the proposed project. Like the proposed project, with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, these alternatives would not result in offsite sensitive receptor locations meeting the Air Pollutant Exposure Zone criterion for cancer risk and impacts related to construction and operational exposure to toxic air contaminants for Alternatives C, D, E, F, and G would be ***less than significant with mitigation***.

Excess Cancer Risk to Onsite Receptors

Alternative A (No Project/Code Compliant Alternative). Under Alternative A there would be no residential uses or child care facilities developed onsite. Consequently, there would be ***no impact*** related to increased cancer risk at onsite receptors under Alternative A.

Alternative B (Full Preservation/Reduced Program Alternative). For Alterative B, there would be 66 percent of the building area of the proposed project, though building footprints would remain largely the same and, with the exception of a portion of Block 1, the location of residential receptors would remain largely the same as under the proposed project. Given the magnitude of the unmitigated risk values for the project at onsite receptors (387 in one million) even with reduced construction durations, construction-related risk would result in significant impacts without mitigation. Like the proposed project, with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, Alternative B would not result in onsite sensitive receptor locations meeting the Air Pollutant Exposure Zone criterion for cancer risk, and impacts

related to construction and operational exposure to toxic air contaminants would be ***less than significant with mitigation***.

Alternatives C, D, E, F, and G (Full and Partial Preservation Alternatives). Reduction in building area development under Alternatives C, D, E, F, and G would be marginal, with development ranging from 94 to 99 percent of the proposed project, and the location of residential receptors would remain largely the same as under the proposed project. Therefore, the impact of these alternatives with respect to cancer risk to onsite receptors would be the same as for the proposed project. Like the proposed project, with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, these alternatives would not result in onsite sensitive receptor locations meeting the Air Pollutant Exposure Zone criterion for cancer risk, and impacts related to construction and operational exposure to toxic air contaminants under Alternatives C, D, E, F, and G would be ***less than significant with mitigation***.

PM2.5 Concentrations at Offsite Receptors

As discussed in Section 4.G, Air Quality (see Table 4.G.10, Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Proposed Project at Offsite Receptors), $PM_{2.5}$ concentrations from the proposed project at all offsite receptor locations would be below significance thresholds for construction and operation without mitigation. Because all alternatives would result in a reduction in the square footage of development of the proposed project and construction-related $PM_{2.5}$ emissions are expected to roughly correlate with the reduction in square footage, all project alternatives would result in less operational emissions of $PM_{2.5}$, and like the proposed project, impacts to offsite receptors under Alternatives A through G would be ***less than significant***.

PM2.5 Concentrations at Onsite Receptors

As discussed in Section 4.G, Air Quality (see Table 4.G.11, Lifetime Cancer Risk and $PM_{2.5}$ Concentration Contributions of the Proposed Project at Onsite Receptors), $PM_{2.5}$ concentrations from the proposed project at all onsite receptor locations would be below significance thresholds for construction and operation, without mitigation. Because all alternatives would result in a reduction in the square footage of development of the proposed project and construction-related $PM_{2.5}$ emissions are expected to roughly correlate with the reduction in square footage, all project alternatives would result in less operational emissions of $PM_{2.5}$. Alternative A would have no residential or childcare uses, and therefore, there would be ***no impact*** related to onsite receptors. Like the proposed project, under Alternatives B through G impacts to onsite receptors would also be ***less than significant***.

Cancer Risk from Operation of Proposed Land Uses

Like the proposed project, all seven alternatives would result in onsite operation of production, distribution, and repair (PDR) uses and all but Alternative A would result in development of R&D/life science uses. Sources of TAC emissions from both of these land use types are usually subject to the Bay Area Air Quality Management District's permitting process, which requires implementation of Best Available Control Technology for toxics and would deny an Authority to Construct or a Permit to Operate for any new or modified source of toxic air contaminants that exceeds a cancer risk of 10 in one million or a chronic or acute hazard index of 1.0. Consequently,

Mitigation Measure M-AQ-4, Siting of Uses that Emit Toxic Air Contaminants, would apply to all seven alternatives, and with implementation Mitigation Measure M-AQ-4 together with Mitigation Measures M-AQ-2a (Construction Emissions Minimization) and M-AQ-2b (Diesel Backup Generator Specifications), the resultant impact would be ***less than significant with mitigation*** for all alternatives. Mitigation Measure M-AQ-2b, Diesel Backup Generator Specifications, would not apply to Alternative A, as discussed above.

Consistency with Clean Air Plan

Alternative A would be required to comply with the City's Transportation Demand Management (TDM) ordinance, which would require preparation and implementation of a TDM plan and compliance with the City's TDM ordinance could include a shuttle service. Similar to the proposed project, Alternative A would require additional mitigation measures to ensure consistency with the Clean Air Plan, and with inclusion of such mitigation measures, this impact would be ***less than significant with mitigation***. In addition to any TDM-related measures, it would be expected that Mitigation Measures M-AQ-2a (Construction Emissions Minimization), M-AQ-2b (Diesel Backup Generator Specifications), M-AQ-2e (Additional Mobile Source Control Measures), M-AQ-4 (Siting of Uses that Emit Toxic Air Contaminants), and M-AQ-5 (Include Spare the Air Telecommuting Information to Transportation Welcome Packets) would apply to Alternative A.

All other alternatives, like the proposed project, would incorporate a TDM Plan that includes a shuttle service and would be largely consistent with the control measures of the Clean Air Plan. Therefore, like the proposed project, with implementation of Mitigation Measures M-AQ-2a (Construction Emissions Minimization), M-AQ-2b (Diesel Backup Generator Specifications), M-AQ-2d (Electrification of Loading Docks), M-TR-5 (Implement Measures to Reduce Transit Delay), M-AQ-2e (Additional Mobile Source Control Measures), M-AQ-4 (Siting of Uses that Emit Toxic Air Contaminants), and M-AQ-5 (Include Spare the Air Telecommuting Information in Transportation Welcome Packets), the impact of Alternatives B through G would be ***less than significant with mitigation.***

Odors

Like the proposed project, none of the alternatives would create objectionable odors that would affect a substantial number of people. As described for the project, for all alternatives, construction odors associated with diesel-powered vehicles and equipment would be temporary and not likely to extend beyond the project site. During operations, small-scale localized odor issues could occur (e.g., near sources such as solid waste collection, food preparation, etc.), but all alternatives would be required to implement odor controls as required by applicable Bay Area Air Quality Management District regulations that place limitations on odorous substances. Therefore, for Alternatives A through G, odor impacts would be ***less than significant***.

Cumulative Impacts: Regional Air Quality

No single project by itself would be sufficient in size to result in non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative air

quality conditions.[6] As discussed above, the construction-related and operational criteria air pollutant emissions associated with Alternative A would be less than significant with mitigation. Therefore, unlike the proposed project, the contribution of Alternative A to cumulative air quality impacts with respect to regional emissions would be ***less than significant with mitigation***, assuming implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization.

Also as discussed above, all other alternatives would result in significant and unavoidable air quality impacts from both construction and operations, similar to the proposed project. Therefore, the contributions of Alternatives B through G to cumulative air quality impacts would be ***significant and unavoidable with mitigation***, and the same mitigation measures identified for the proposed project would apply to Alternatives B through G.

Cumulative Impacts: Health Risk

Alternative A (No Project/Code Compliant Alternative). Alternative A would result in fewer vehicle trips and would not include backup diesel generators, and would, therefore, result in the same cumulative impact determination for $PM_{2.5}$ impact as the proposed project: less than significant for all receptors. Additionally, Alternative A would also contribute to a cumulative health risk impact for lifetime cancer risk for offsite receptors on the Pier 70 site, but the contribution would be less than significant with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization. Reducing the proposed project risk by 27 percent (to correlate with the reduction of square footage to be constructed in this alternative) results in a risk that is still greater than the significance threshold of 100.[7] However, the maximum mitigated risk would remain under the established threshold for Alterative A. The offsite receptor not located at Pier 70 would likely be less than significant, since 27 percent of the project risk plus the background and Pier 70 risk is below the 100-in-a-million threshold.[8] The maximum cancer risk at a school receptor for Alternative A would be less than significant, similar to the proposed project. There would be no impact to the onsite receptors since no residences would be constructed onsite under this alternative. Thus, overall, contribution of Alternative A to the cumulative health risk impact would be ***less than significant with mitigation***.

Alternative B (Full Preservation/Reduced Program Alternative). The proposed project's contribution to a cumulative health risk impact was determined to be less than significant with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization. Although Alternative B would result in fewer vehicle trips and fewer backup diesel generators would be required, Alternative B would result in a similar contribution to cumulative health risk impact as the proposed project. Impacts to the school receptor for Alternative B would be less

6 BAAQMD, *CEQA Air Quality Guidelines*, May 2017, p. 2-1.

7 The contribution from unmitigated project construction and operation is 388 in a million. Twenty-seven percent of 388 in a million is 105 in a million. The background contribution remains at 30 in a million and the Pier 70 contribution remains at 4.7 in a million. Thus, the estimated resulting cancer risk is 105 + 30 + 4.7 = 140 in one million.

8 The contribution from unmitigated project construction and operation is 47 in a million. Twenty-seven percent of 47 in a million is 13 in a million. The background contribution remains at 56 in a million and the Pier 70 contribution remains at 6.9 in a million. Thus, the estimated resulting cancer risk is 13 + 56 + 6.9 = 76 in one million.

than significant, similar to the proposed project. Thus, overall, the contribution of Alternative B to the cumulative health risk impact would be ***less than significant with mitigation***.

Alternatives C, D, E, F, and G (Full and Partial Preservation Alternatives). As Alternatives C through G would result in only marginally fewer vehicle trips (one to three percent fewer trips) than the proposed project and would require the same number of backup diesel generators as the proposed project, Alternatives C through G would result in similar contributions to cumulative health risk impact as the proposed project, which was determined to be less than significant with implementation of Mitigation Measure M-AQ-2a, Construction Emissions Minimization, primarily as the result of construction-related emissions of diesel particulate matter. Thus, overall, contributions of Alternatives C through G to the cumulative health risk impact would be ***less than significant with mitigation***.

6.D.1.8 Greenhouse Gas Emissions

Similar to the proposed project as described in the initial study in Appendix B, Alternatives A through G would generate greenhouse gas (GHG) emissions, but not at levels that would result in a significant impact on the environment or that would conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. During both construction and operation, the alternatives would generate GHG emissions, primarily related to increases in transportation, energy, and waste disposal uses. However, it can be reasonably assumed that all alternatives would incorporate strategies to reduce GHG emissions to comply with the City's numerous GHG reduction regulations, thereby being consistent with the City's GHG Reduction Strategy.

Compliance with the City's Commuter Benefits Program, Emergency Ride Home Program, transportation management programs, Transportation Sustainability Fee, Jobs-Housing Linkage Program, bicycle parking requirements, low-emission car parking requirements, and car sharing requirements would reduce the alternatives' transportation-related emissions. All alternatives would be required to comply with the energy efficiency requirements and/or renewable energy criteria of the City's Green Building Code, Stormwater Management Ordinance, Water Conservation and Irrigation ordinances, and Energy Conservation Ordinance, all of which would promote energy and water efficiency, thereby reducing the alternatives' energy-related GHG emissions. Waste-related GHG emissions for all alternatives would be reduced through compliance with the City's Recycling and Compositing Ordinance, Construction and Demolition Debris Recovery Ordinance, and Green Building Code requirements. These regulations reduce the amount of materials sent to a landfill, reducing GHGs emitted by landfill operations. Compliance with the City's Street Tree Planting requirements would serve to increase carbon sequestration. Other regulations, including those limiting refrigerant emissions and the Wood Burning Fireplace Ordinance would reduce emissions of GHGs and black carbon, respectively. Compliance with regulations requiring low-emitting finishes would reduce volatile organic compounds.

Assuming compliance with the above regulations, similar to the project, all alternatives would be consistent with the City's GHG Reduction Strategy, which in turn implies consistency with the goals of state and regional plans and policies related to GHG reduction. Therefore, Alternatives A through G would not generate GHG emissions at levels that would result in a significant impact on

the environment or conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. Therefore, like the proposed project, impacts related to GHG emissions for all alternatives would be ***less than significant***.

6.D.1.9 Wind and Shadow

Wind and shadow impacts of the proposed project are described in Chapter 4, Section 4.H, and as described below, wind and shadow impacts of the alternatives would be similar. See Section 4.H for more detailed description of the impacts.

Wind

Wind Impacts under Buildout Conditions

Chapter 4, Section 4.H, describes the quantitative, wind-tunnel testing methodology used to determine that the proposed project at buildout would not result in an increase in the number of hours that the Planning Code wind hazard criterion is exceeded or an increase in the area that is subjected to winds that exceed the hazards criterion. The wind tunnel testing results indicated that the proposed project at buildout would not alter wind speeds in a manner that substantially affects public areas in the vicinity of the project site. Therefore, the wind impacts of the project at buildout would be less than significant. No wind tunnel testing was conducted for any of the alternatives. However, based on the project's test results, comparative wind impacts of the alternatives relative to those of the project can be inferred, as described below.

Alternative A (No Project/Code Compliant Alternative) would have much less total building mass than the project, with all buildings no more than 40 feet tall, and therefore would have much less effect on existing wind patterns at the site. Typically, no wind-tunnel testing would be required for such a development, because as described in Section 4.H, new buildings less than approximately 80 feet in height are unlikely to result in substantial adverse effects on ground-level winds such that pedestrians would be uncomfortable or hazardous wind conditions would result. Therefore, wind impacts for Alternative A at buildout would be ***less than significant***, similar to the proposed project, although with much less effect on wind patterns than the proposed project, and its contribution to cumulative wind impacts would also be less than significant.

Alternative B (Full Preservation/Reduced Program Alternative) at buildout would likely result in similar wind conditions when compared to the project because it would have a similar land use configuration but with overall reduced massing and heights of the structures. Thus, wind impacts of Alternative B at buildout would be ***less than significant***, and its contribution to cumulative wind impacts would also be less than significant.

Alternative C (Full Preservation/ Similar Program Alternative) at buildout would likely result in locally worse wind conditions, compared to the project, particularly around its four towers of 240 to 300 feet in height. As noted in Chapter 4, Section 4.H, wind impacts are generally higher for projects that include taller towers, and Alternative C would include two 300-foot-tall and two 240-foot-tall towers compared to one 300-foot-tall and three 180-foot-tall towers for the proposed

project. In the absence of massing-specific wind-tunnel testing of this alternative, to be conservative, wind impacts of Alternative C are assumed to be ***significant and unavoidable with mitigation***, although it is unknown at this time what feasible mitigation measures would be available. Although minor design refinements would likely be required as part of building design to reduce wind exceedances, it is unknown if these measures could reduce potentially significant increases in wind hazard conditions to less than significant levels. Similarly, to be conservative, its contribution to cumulative wind impacts would also be considered ***significant and unavoidable with mitigation***.

Alternative D (Partial Preservation 1 Alternative) would likely result in similar wind conditions as those of the project because the only major change in massing is the relocation of the 300-foot tower one block east, from Block 6 to Block 7. This would likely result in similar wind conditions as those identified for the proposed project, with only some local shifts in wind conditions. Thus, overall, at a qualitative level, wind impacts of Alternative D at buildout would be ***less than significant*** and its contribution to cumulative wind impacts would also be less than significant. This assumes that based on the similarities in massing to that of the proposed project, minor design refinements, such as the wind canopy or wind screen included in the proposed project, would be part of the building design if necessary.

Alternative E (Partial Preservation 2 Alternative) would likely result in similar wind conditions as those of the proposed project, as this alternative is nearly identical in overall massing and location of structures as the proposed project. Therefore, wind impacts of Alternative E at buildout would be ***less than significant*** and its contribution to cumulative wind impacts would also be less than significant. This alternative would likely require the same wind canopy south of the 300-foot tower as with the project and the porous wind screen surrounding the proposed rooftop soccer field on Block 5.

Alternatives F and G (Partial Preservation 3 and 4 Alternatives) would likely result in worse wind conditions, compared to the project, because of the massing of Block 5. In both Alternatives F and G, Block 5 would be developed with a 180-foot tall building with a relatively wide westerly façade, which faces into the prevailing winds, and that façade would have no podium level or setbacks to minimize wind acceleration at ground level. Because this building would be at the southwest corner of the project site, it would be the first tall building on the project site to be reached by approaching westerly, northwesterly, and southwesterly winds. As a result, this building would redirect those winds down to ground level and accelerate them. This would likely cause wind speeds to exceed the hazard criterion at one or more locations around the base of this building. Under existing-plus-project conditions, wind speeds would exceed the hazard criterion for four hours annually at test point 83, at the southwest corner of Block 5. The configuration of the Block 5 building in Alternatives F and G would likely result in a substantial increase in the number of hours of wind hazard criterion exceedance at the southwest corner of Block 5, and could also result in the wind hazard criterion being exceeded at additional test points. While it is possible that wind reduction treatments (e.g., awnings, vertical fins, chamfered building corners) could reduce ground-level wind speeds around Block 5, the effectiveness of these measures is uncertain. Therefore, for purposes of a conservative analysis, this EIR determines that wind impacts of Alternatives F and G at buildout would be ***significant and***

unavoidable with mitigation, although it is unknown at this time what feasible mitigation measures would be available. Similarly, to be conservative, their contribution to cumulative wind impacts would also be considered ***significant and unavoidable with mitigation***.

Interim Wind Hazards due to Project Phasing

For the proposed project, it was concluded that the phased construction could result in temporary increases in wind hazard conditions, and due to uncertainties of the nature and extent of interim conditions and feasibility of interim wind-reduction measures, this impact was determined to be significant and unavoidable with mitigation. The mitigation consisted of identifying interim hazardous wind impacts, and then developing wind reduction measures as appropriate. With the exception of Alternative A, this impact and mitigation measure also applies to all other alternatives. Alternative A would involve construction of buildings no taller than 40 feet, so even during interim periods of construction, no substantial changes in wind impacts would be expected. Therefore, for Alternative A, this impact would be ***less than significant***. For Alternatives B through G, however, interim wind conditions cannot be determined at this time, and the same mitigation measure—Mitigation Measure M-WS-2, Identification and Mitigation of Interim Hazardous Wind Impacts—would apply to these alternatives but uncertainties remain as to the feasibility or effectiveness of this measure. Therefore, like the proposed project, for Alternatives B though G, this impact would be ***significant and unavoidable with mitigation***.

Shadow

As described in Section 4.H, to evaluate the shadow impact of the proposed project, a 3D virtual model of the project area was prepared and shadow diagrams were developed depicting the movement of project shadows across the project site and surrounding area at representative times of day and days of the year. The shadow model considers the proposed project at full buildout based on the maximum height of proposed structures and maximum coverage of each block on the project site; the model does not include required building setbacks at upper stories, and is therefore a worst-case scenario. The shadow analysis determined that the proposed project would not create new shadow in a manner that substantially affects outdoor recreation facilities or other public areas, and that this impact would be less than significant at both a project and cumulative level. No similar shadow modeling was conducted for any of the alternatives. However, based on the project's test results, comparative shadow impacts of the alternatives relative to those of the project can be inferred, as described below.

Alternative A (No Project/Code Compliant Alternative) would include maximum building heights of 40 feet, so shadow impacts would be substantially less than those of the project. No shadows from this alternative would extend as far as Esprit Park, unlike the project, and shadows cast on the Bay Trail would be substantially less than those of the project. Shadow impacts of Alternative A would be ***less than significant***.

Alternatives B, C, D, E, F and G (Full and Partial Preservation Alternatives) would have similar shadow effects to those of the project. Shadow effects of Alternative B would be somewhat less than those of the project because of the reduced building heights, while shadow effects of Alternative C would be somewhat greater than those of the project due to the greater number of

towers (two 300-foot towers and two 240-foot towers under Alternative C compared to one 300-foot tower and three 180-foot buildings under the project). Alternatives D, E, F, and G would all have similar shadow effects to those of the project. However, for Alternatives B, D, E, F, and G, because no shadow from any alternative would reach any parks, it is not expected that new shadows would be created in a manner that substantially affects outdoor recreation facilities or other public areas, either at a project or cumulative level, and this impact would be ***less than significant***.

Under Alternative C, based on a preliminary shadow fan analysis conducted during the project design phase,[9] there would not likely be any shadow cast on Esprit Park or any other parks governed by section 295 of the Planning Code; however, Alternative C would result in greater shadow effects on other nearby open spaces, streets, and sidewalks compared to that of the proposed project. Therefore, shadow impacts of Alternative C would also be ***less than significant***.

6.D.1.10 Recreation

Similar to the proposed project, as described in the initial study (see Appendix B), all of the alternatives would increase the use of existing neighborhood parks and other recreational facilities, but not to such an extent such that substantial physical deterioration of the facilities would occur or be accelerated, or such that the construction of new or expanded facilities would be required. The initial study (see Appendix B) concluded that this would be a less-than-significant impact for the proposed project because the proposed development of 6.2 acres of open space and recreational facilities would offset the increased demand for open space and recreation by future residents at the project site, and therefore any increase in use of existing public facilities would not be expected to result in substantial physical deterioration of public parks or recreational facilities. Alternatives B through G would all include the same 6.2 acres of open space and recreational facilities, and the residential demand for all of these alternatives would be of similar magnitude or less than the proposed project; therefore, this impact would also be less than significant for these alternatives. While Alternative A would include less open space than the proposed project (4.4 acres compared to 6.2), there would be no residential uses under this alternative and the increase in demand for open space by future employees and visitors would be substantially less compared to that of the project, since as described in the initial study, residents make the greatest active use of parks and open spaces, and impacts on recreational resources would be also less than significant. Therefore, like the proposed project, impacts of Alternatives A through G on recreational resources at both a project- and cumulative level, would be ***less than significant***.

[9] City and County of San Francisco, *Potrero Power Station Mixed-Use Development Project, Alternative C: Full Preservation Initial Shadow Fan Analysis*, July 16, 2018

6.D.1.11 Utilities and Service Systems

Water Supply

Similar to the proposed project, as described in the initial study (see Appendix B), the City's water service provider would have sufficient water supply available to serve any of the alternatives from existing entitlements and resources, and none of the alternatives would require new or expanded water supply resources or entitlements. The approved water supply assessment for the proposed project concluded that the increased long-term water demand of the project is accounted for within San Francisco's overall retail water demand and that existing water supplies would be sufficient to meet the project's demand. Therefore, the project impacts related to water supply would be less than significant. Because the development program under all alternatives would be similar to or smaller than that of the proposed project, the estimated water demand for all alternatives would be similar to or less than that of the project. Consequently, for all of the alternatives, the increased long-term water demand is accounted for within San Francisco's overall retail water demand, and existing water supplies would be sufficient to meet the that demand. Similarly, like the proposed project, any construction needed to upsize the water distribution facilities for any of the alternatives would not result in significant environmental effects not already disclosed in this EIR. Therefore, for Alternatives A through G, like the proposed project, impacts related to water supply both at a project-specific and cumulative level, would be ***less than significant***.

Wastewater

None of the alternatives would exceed wastewater treatment requirements of the Southeast Water Pollution Control Plant. As described in the initial study (see Appendix B), the estimated wastewater demand of the proposed project would be well within the remaining capacity of the Southeast Plant, and the project's impact on wastewater treatment requirements would be less than significant. Because the magnitude of development under all alternatives would be similar to or less than that of the proposed project, the estimated wastewater demand for all alternatives would be similar to or less than that of the project, and therefore also within the remaining capacity of the Southeast Plant. Therefore, for Alternatives A through G, like the proposed project, impacts related to wastewater treatment requirements would be ***less than significant***.

Similarly, none of the alternatives would require or result in the construction of new wastewater treatment facilities or expansion of existing facilities, the construction of which would cause significant environmental effects. The SFPUC has confirmed that the combined sewer system, including ongoing system upgrades, has sufficient downstream capacity to convey wastewater flows generated from the proposed project to the Southeast Plant, which would also be true of any of the alternatives since they would generate the same or less volume of wastewater as the project. Therefore, none of the alternatives would require new or expanded wastewater facilities to accommodate anticipated demand, and for Alternatives A through G, impacts related to the construction of new or expanded wastewater treatment facilities and wastewater treatment capacity, both at a project-specific and cumulative level, would be ***less than significant***.

Stormwater

None of the alternatives would require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. Like the proposed project, all of the alternatives would have one of two options for stormwater drainage: (1) a dual system in which a portion of the site drains to the combined sewer system and a portion of the site drains to a separate stormwater only system, or (2) a project-wide combined sewer system. As described in the initial study (see Appendix B), like the project, all of the alternatives would be required to comply with the City's Subdivision Regulations, which specify that both the combined sewer system and any separate stormwater system, streets, and drainage channels must have sufficient capacity to accommodate a specified amount of stormwater runoff from the entire tributary area. Regardless of which stormwater option would be selected for an alternative, the alternative would be required to comply with these regulatory standards as a condition of approval such that stormwater flows from the project site would be accommodated within the newly constructed infrastructure. Thus, for Alternatives A through G, proposed stormwater improvements would accommodate stormwater runoff in compliance with applicable regulations and no new or expanded stormwater drainage facilities beyond those included as part of the alternative would be required. Therefore, like the proposed project, impacts related to stormwater drainage for Alternatives A through G, both at a project-specific and cumulative level, would be ***less than significant***.

Solid Waste

Similar to the project, all of the alternatives would result in increased generation of solid waste, but the increases would be served by a landfill with sufficient capacity, and all of the alternatives would comply with all applicable statutes and regulations related to solid waste. Like the project, all alternatives would be required to comply with existing solid waste diversion regulations (e.g., Green Building Ordinance and the San Francisco Construction and Demolition Debris Recovery Ordinance) and recycling regulations (e.g., Mandatory Recycling and Composting Ordinance), which would minimize the amount of solid waste generated during construction and operations. Because the magnitude of development under all alternatives would be similar to or less than that of the proposed project, the estimated solid waste generated by all alternatives would be similar to or less than that of the project; therefore, like the project, existing landfill capacity would accommodate solid waste disposal needs. Therefore, construction and operation of Alternatives A through G would not exceed available permitted landfill capacity, and all alternatives would comply with the applicable solid waste disposal policies and regulations. Therefore, like the proposed project, impacts related to solid waste, both at a project-specific and cumulative level, would be ***less than significant*** for all alternatives.

6.D.1.12 Public Services

Fire Protection and Emergency Medical Services

Like the project, as described in the initial study (see Appendix B), development under all of the alternatives would result in an increase in demand for fire protection and emergency medical services. As described in the initial study (see Appendix B), both construction and operation of the

project would be required to comply with fire and building code requirements that would minimize demand for future fire protection services (e.g., sprinkler systems; fire-rated design, construction, and materials; restrictions on occupant loads; emergency lighting; smoke alarms; and mechanical smoke control and emergency notification systems), and these same requirements would apply to all of the alternatives, and would minimize the demand for future fire protection services. In addition, similar to the project, all alternatives would be subject to City requirements regarding extension of the high pressure auxiliary water supply system that would serve the project site for firefighting, including coordination with the fire department to determine utility and access requirements for fire protection and emergency services at the project site during construction and operation. As described in Section 4.E, Transportation and Circulation, the fire department reviewed and generally agreed to the preliminary design plans for the proposed street network and the fire access plan, and it is assumed this same process would occur for all alternatives to ensure adequate emergency access would be maintained. Adherence to San Francisco Fire Code requirements as part of the design of all alternatives would minimize demand for future fire protection services.

Nevertheless, like the proposed project (see initial study, Appendix B), all alternatives would result in an increase in demand for fire and emergency medical services attributable to the increase in the residential and employment population at the project site and could require additional fire protection personnel and emergency medical responders; however, the number of additional personnel or equipment that would be attributable to a specific alternative is unknown at this time. The San Francisco Fire Department has indicated that it is in the process of identifying citywide service and facility needs; however, no new facilities are currently proposed. Demand is calculated based on citywide growth and is not generally based on a project-level basis. In the absence of a citywide analysis, it cannot be determined if the project alternatives would require the construction of new or expanded fire protection facilities or where such facilities, if required, would be located. Therefore, like the proposed project, at this time it would be too speculative to evaluate whether or not operation of any of the alternatives would indirectly result in substantial adverse physical impacts associated with construction or alteration of fire protection facilities triggered by any of the alternatives. Even assuming that construction of such facilities were to be warranted, construction would be required to comply with all regulatory requirements designed to avoid or minimize environmental impacts and would be subject to environmental review under CEQA. Thus, like the proposed project, indirect impacts from construction of new facilities are considered ***less than significant*** at both the project-specific and cumulative level, for all alternatives.

Police Protection Services

Like the project, all of the alternatives would result in more intensive use of the project site compared to existing conditions and would increase the service population on the site, which would result in an increased demand for police protection services. As described in the initial study (see Appendix B), the project site is located within the Bayview Police District, and communication with the San Francisco Police Department regarding the proposed project has indicated that the increased demand for police services associated with the proposed project

could be accommodated by existing facilities.[10] Since all of the alternatives would generate the same or less onsite service population as the project, it is reasonable to assume that existing facilities would also be sufficient to accommodate any of the alternative's police protection needs. Therefore, like the proposed project, the increase in demand for police protection associated with any of the alternatives would not be to an extent that would require the construction of additional facilities or expansion of existing facilities in order to maintain acceptable service ratios, response times, or other performance objectives for police protection. Thus, like the proposed project, Alternatives A through G, both at the project-specific and cumulative level, would have a ***less-than-significant*** impact related to police protection services.

Schools

Alternative A (No Project/Code Compliant Alternative) would have ***no impact*** on schools because there would be no residential uses; thus, no additional students would be generated under Alternative A.

As described in the initial study (see Appendix B), the San Francisco Unified School District has capacity for almost 64,000 students, and student enrollment as of fall 2016 was approximately 57,500 students. Given the district's overall capacity and the estimated increase of up to 392 students under the project, the proposed project is not anticipated to necessitate the need for new school facilities or the expansion of existing school facilities, and the impact would be less than significant. Likewise, Alternatives B through G would not be anticipated to result in an increase in demand for school services to an extent that would result in substantial adverse physical impacts associated with the construction or alteration of governmental facilities because the estimated increase in students would be the same as or less than that of the proposed project. Therefore, like the proposed project, the impact on schools for Alternatives B through G, both at a project-specific and cumulative level, would be ***less than significant***.

Libraries

Like the project, development under all of the alternatives would result in an increase in demand for library services. As described in the initial study (see Appendix B), the existing library branches near the project site have been either recently renovated or newly constructed following the passage of the Branch Library Improvement Program in 2000 and in accordance with the Branch Facilities Plan, and these resources were determined to be sufficient to accommodate the increase in demand generated by the proposed project. Because all alternatives would have the same or less residential and employment population as the project, it is reasonable to assume that existing facilities would also be sufficient to accommodate any of the alternatives' library needs. Therefore, like the proposed project, none of the alternatives would require construction of new or expanded library facilities, and the impacts of Alternatives A through G on library services, both at a project-specific and cumulative level, would be ***less than significant***.

[10] Lt. Kathryn Waaland, Officer in Charge, Legal Division City and County of San Francisco Police Department, email correspondence with Jennifer Brown, Senior Associate, Environmental Science Associates, March 14, 2018.

6.D.1.13 Biological Resources

Project impacts on biological resources are described in Chapter 4, Section 4.I, and as described below, impacts of the alternatives on these resources would be similar. See Section 4.I for more detailed description of the impacts.

Special Status Terrestrial and Bird Species

Similar to the proposed project, all of the alternatives would involve demolition of existing structures and multi-year construction activities at the project site, which could have a substantial adverse effect either directly or through habitat modifications on species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. At the project site, this would apply to migratory birds and to special-status bats. Nesting birds may be present on or adjacent to the project site, and construction could adversely affect bird breeding and nesting behavior, a potentially significant impact. However, implementation of Mitigation Measure M-BI-1, Nesting Bird Protection Measures, which requires nesting bird protection measures, would reduce this impact to less than significant. Similarly, special-status bats have the potential to roost in existing vacant or under-utilized buildings within or near the project site, and demolition and/or rehabilitation under any of the alternatives could result in direct mortality of or indirect disturbance to roosting special-status bats, if present. However, implementation of Mitigation Measure M-BI-3, Avoidance and Minimization Measures for Bats, would reduce this impact to less than significant. Therefore, like the proposed project, construction impacts related to special status terrestrial species under Alternatives A through G, at both a project and cumulative level, would be ***less than significant with mitigation***.

Like the proposed project, operation of any of the alternatives would not have a substantial adverse effect either directly or through habitat modifications on migratory birds and/or on bird species identified as special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. All alternatives would be required to comply with the Standards for Bird-Safe Buildings, which would avoid or minimize the adverse effects of avian collisions during operation of any of the alternatives. Therefore, like the proposed project, operational impacts related to migratory birds and/or on special status bird species under Alternatives A through G, at both a project and cumulative level, would be ***less than significant***.

Special Status Marine Species

Like the proposed project, all alternatives could include in-water associated with construction of a new stormwater outfall, and all but one alternatives would also include construction of the proposed dock. In-water construction of these structures could have a substantial adverse effect, either directly or through habitat modification, on marine 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, U.S. Fish and Wildlife Service, or National Oceanic and Atmospheric Administration. Alternative A does not include construction of a dock, and

therefore would have substantially less severe impacts on marine special status species compared to the proposed project.

Under Alternatives B through G, construction in and adjacent to the San Francisco Bay, particularly construction of the proposed dock, has the potential for affecting water quality and habitat for special status marine species, including certain fish species and marine mammals. The proposed project includes in-water construction avoidance and minimization measures to minimize impacts on water quality and habitat during construction of the dock. If not included as part of Alternatives B through G, these measures would need to be included as mitigation measures to be implemented in conjunction with any other water quality protection measures required under construction permits (e.g., stormwater runoff construction permit) and/or ongoing remediation activities as required by the San Francisco Regional Water Quality Control Board. Together, these measures would reduce impacts on water quality to a less-than-significant level. In addition, construction of the proposed dock would require pile driving, which can generate high levels of underwater noise that is harmful to fish and marine mammals. However, like the proposed project, implementation Mitigation Measure M-BI-4, Fish and Marine Mammal Protection during Pile Driving, would ensure that potential impacts from pile installation would be less than significant. Therefore, as was identified for the proposed project, impacts of Alternatives B through G from in-water construction associated with the proposed dock would be ***less than significant with mitigation***. On the other hand, for Alternative A, which would not include construction of a dock, compliance with water quality protection measures required during construction (e.g., stormwater runoff construction permit) and/or ongoing remediation activities as required by the San Francisco Regional Water Quality Control Board would ensure that unlike the proposed project, impacts of any construction activities along the shoreline on special status marine species would be ***less than significant***.

Similarly, like the proposed project, operation of Alternatives A through G would not be expected to have a substantial adverse effect on special-status marine species. Minor effects associated with increased overwater shading and increased vessel traffic associated with the recreational dock under Alternatives B through G, and operation of the stormwater outfall associated with all these alternatives would result in negligible changes from the existing conditions and have a very limited impact on listed marine species. Therefore, impacts on marine resources associated with operation of all alternatives would be ***less than significant,*** as under the proposed project**.**

Sensitive Natural Communities

Like the proposed project, none of the alternatives would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game U.S. Fish and Wildlife Service, or the National Marine Fisheries Service. The project site contains no sensitive terrestrial communities. Within the San Francisco-Bay Delta region, the National Marine Fisheries Service has identified eelgrass beds as a habitat area of particular concern. No eelgrass beds exist within the project study area, so there would be no impact on this sensitive natural community and the fish that reside within such habitat. Within the project area, a few scattered native oysters are

present on the intertidal rock and debris that comprise the existing shoreline; studies of similar habitat at Piers 64 and 70 concluded that protection of existing oysters was not warranted and that post-construction stabilized shoreline would provide an improved substrate for successful recolonization by oysters. Therefore, like the proposed project, impacts of Alternatives A through G on sensitive natural communities would be ***less than significant***.

Jurisdictional Waters

Like the proposed project, construction of Alternatives A through G could have a substantial adverse effect on federally protected waters as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means. Under all alternatives, construction of physical shoreline improvements to protect against future sea level rise and/or for a new stormwater outfall for discharging stormwater could result in placement of fill within the jurisdictional waters of the San Francisco Bay. In addition, under Alternatives B through G, construction of a floating dock would also result in placement of fill within jurisdictional waters. Alternative A, the No Project/Code Compliant, does not include construction of a dock. Any activities resulting in the placement of fill in the bay or other disturbances to jurisdictional water would require permit approval from the U.S. Army Corps of Engineers and a water quality certification from the Regional Water Quality Control Board. As part of the permit conditions, the project sponsor would be required to avoid or minimize to the maximum extent practicable placement of fill in jurisdictional waters. In addition, permanent placement of new fill resulting in the loss of jurisdictional waters may trigger a requirement for compensatory mitigation aimed at restoring or enhancing similar ecological functions and services as those displaced. Implementation of Mitigation Measure M-BI-7, Compensation for Fill of Jurisdictional Waters, like the proposed project, would reduce this impact to a less-than-significant level. Therefore, like the proposed project, the construction impacts of all alternatives on jurisdictional waters would be ***less than significant with mitigation***. Alternatives B through G would be expected to result in placement of a similar magnitude of fill in jurisdictional waters as the proposed project and require a similar magnitude and type of compensatory mitigation. Alternative A would be expected to result in placement of much less fill in jurisdictional waters than the proposed project because it would not involve construction of a dock, and therefore require a reduced magnitude of compensatory mitigation. Past, present, and reasonably foreseeable future projects along the bay shoreline have resulted in and continue to result in a cumulative impact associated with placement of fill in jurisdictional waters. However, with implementation of the compensatory mitigation as required by the resource agencies, the alternatives' contribution to cumulative impacts would be less than significant. Therefore, like the proposed project, this cumulative impact for all alternatives would be ***less than significant with mitigation***.

Similarly, like the proposed project, operation of Alternatives A through G would not be expected to have a substantial adverse effect on jurisdictional waters. Potential effects associated with maintenance dredging for vessel access, resuspension of sediments during dredging, and mobilization of chemicals of concern associated with the recreational dock under Alternatives B through G would be minimized through required compliance with the long-term management strategy for dredging in San Francisco Bay and with any applicable regional-board approved risk

management plans. Therefore, like the proposed project, impacts on jurisdictional waters associated with operation of all alternatives would be ***less than significant.***

Wildlife Movement

Similar to the proposed project, construction of any of the alternatives could affect nesting birds, but implementation of Mitigation Measure M-BI-1, Nesting Bird Protection Measures, would reduce this impact to ***less than significant with mitigation***. In addition, construction of the dock under Alternatives B through G, could generate high levels of underwater noise that is harmful to the movement of fish and marine mammals, but implementation of Mitigation Measure M-BI-4, Fish and Marine Mammal Protection during Pile Driving, would reduce this impact to ***less than significant with mitigation***.

Plans and Policies Related to Biological Resources

As described in Chapter 4, Section 4.I, there are no adopted habitat conservation or natural community conservation plans that apply to the terrestrial or marine areas on or adjacent to the project site, and there are no protected significant or landmark trees on the project site. Therefore, like the proposed project, none of the alternatives would conflict with any local policies or ordinances protecting biological resources or the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, like the proposed project, the impacts of Alternatives A through G related to plans and policies related to biological resources would be ***less than significant***.

6.D.1.14 Geology, Soils, and Paleontological Resources

Impacts related to geology, soils, and paleontological resources for all alternatives would be the same (or less severe) as those of the proposed project, as described in the initial study (see Appendix B). This is because all alternatives would be located at the same project site and would involve similar (or less intensive) construction. Alternatives C through G would involve the same or very similar magnitude and nature of construction as the proposed project, while Alternatives A and B would have reduced construction. Alternative A, the No Project/Code Compliant alternative, would have a reduced project site area since it does not include the PG&E sub-area; construction requirements would be substantially reduced in magnitude and duration compared to the project, with only 27 percent of the building area and less intensive foundation requirements since all buildings would be a maximum of 40 feet in height. Alternative B, the Full Preservation/Reduced Program alternative, would have similar construction requirements compared to the proposed project because it would encompass the same 29-acre project site, but foundation requirements could be somewhat reduced because the maximum building height would be 200 feet instead of 300 feet.

Therefore, as described in the initial study (see Appendix B), like the proposed project, geologic impacts for Alternatives A through G would be ***less than significant*** for all impacts, at both a project and cumulative level, related to the following:

- **Geologic Hazards**. As under the proposed project, Alternatives A through G would require a site-specific geotechnical investigation to provide information about geotechnical hazards that must be addressed in the project's design, including design requirements for buildings 240 feet or taller. Given implementation of the recommendations in the geotechnical investigation and building code requirements, none of the alternatives would expose people or structures to potential substantial adverse effects associated with seismic hazards, including fault rupture, seismic ground shaking, liquefaction and seismically-induced ground failure, seismically-induced lateral spreading, or seismically-induced landslides. Furthermore, like the proposed project, none of the alternatives would exacerbate existing or future seismic hazards.

- **Soil Erosion and Loss of Topsoil**. As under the project, compliance with stormwater management requirements during construction and remediation activities, and given appropriate design, none of the alternatives would result in substantial erosion. Previous development at the project site has resulted in removal of any topsoil, so for all alternatives, there would be no impact related to loss of topsoil.

- **Unstable Geologic Unit**. The project site is not located on a geologic unit that is unstable or that could become unstable as a result of proposed development under each of the alternatives. The project site is primarily located within an area of gentle slope at low elevation that has little or no potential for the formation of slumps, translational slides, or earthflows. All alternatives would be required to comply with San Francisco and/or Port of San Francisco requirements for site-specific geotechnical reports in accordance with Section 1803 of the San Francisco and Port of San Francisco Building Codes to ensure that the potential settlement effects of excavation, construction-related dewatering, and pile driving are adequately addressed. In addition, site-specific geotechnical reports would be required for all of the alternatives, subject to review and approval by the City's Department of Building Inspection or the Port of San Francisco, as part of the building permit approval process, and implementation of the required site-specific recommendations related to settlement would ensure that the geologic unit at the project site would not become unstable as a result of proposed development under each of the alternatives.

- **Expansive or Corrosive Soils**. None of the alternatives would create substantial risks to life or property as a result of locating buildings or other features on expansive or corrosive soils. Much of the project site is underlain directly by bedrock, which is not expansive. While the artificial fill beneath the project site could include some expansive clay, the Young Bay Mud below the water table is permanently saturated, and is not subject to moisture changes that would cause expansion and contraction. Testing conducted for the proposed project indicated that the fill material is moderately corrosive (see initial study, Appendix B), but for all alternatives buried features would be constructed to resist corrosion in accordance with the applicable requirements of the building code.

- **Changes in Topography**. Currently, the site is relatively flat, and there are not unique geologic or physical features on the site. Like the proposed project, under all alternatives, grading would be required to increase site elevation by up to 9 feet along the shoreline to prevent inundation due to sea level rise. However, this grading would not result in a substantial change in topography because no existing slopes would be eliminated and no new slopes would be created as a result of raising the site elevation.

Paleontological Resources

Like the proposed project, all alternatives could directly or indirectly destroy a unique paleontological resource because some of the geologic materials underlying the site have the potential to contain significant fossils (see initial study, Appendix B), which could be encountered during construction of any of the alternatives. However, implementation of Mitigation Measure M-GE-6 would ensure that the alternatives would not cause a substantial adverse change to the scientific significance of a paleontological resource and would reduce this impact to a less-than-significant level. Therefore, like the proposed project, for Alternatives A through G, potential impacts on paleontological resources, both at a project-specific and cumulative level, would be ***less than significant with mitigation***, with implementation of the same mitigation measure identified for the proposed project.

6.D.1.15 Hydrology and Water Quality

Project impacts on hydrology and water quality are described in Chapter 4, Section 4.J, and as described below, impacts of the alternatives on these resources would be similar. See Section 4.J for more detailed description of the impacts.

Construction Impacts

Like the proposed project, construction of all alternatives could violate water quality standards or otherwise degrade water quality. As described in Section 4.J for the project, water quality impacts to the bay from on-land construction activities at the project site would be minimized through implementation of control measures and best management practices specified under state and local regulations, including the construction general stormwater permit, the City's construction site runoff control permit, erosion and sediment control plan, and stormwater pollution prevention plan; and for Alternatives A through G, this impact would be ***less than significant***. As under the project, Alternatives B through G would include in-water construction necessary for construction of the proposed dock, which could affect bay water quality, but compliance with permit requirements and water quality certification would ensure that the anticipated temporary water quality impacts related to construction activities in the San Francisco Bay would be ***less than significant***. Furthermore, if any of the alternatives were to conduct groundwater dewatering during construction, compliance with state and local regulatory requirements for discharge of dewatering effluent would protect water quality, and like the proposed project, this impact would be ***less than significant***.

However, for all alternatives, like the project, construction of a new stormwater outfall (if a separate stormwater system is constructed) would likely occur within an offshore area undergoing remediation by PG&E, which could interfere with offshore sediment remediation, thereby creating a potential water quality impact. This impact would be remediated through compliance with the Offshore Sediment Risk Management and Monitoring Plan to be prepared by PG&E and which would be subject to approval by the Regional Water Quality Control Board. However, the project sponsor would need to implement risk management measures for the offshore sediment remediation area as required by the regional board to ensure water quality is appropriately protected. Therefore, like the proposed project, for Alternatives A through G, with implementation

of regulatory requirements of the regional board for risk management, this impact would be ***less than significant***.

Operational Impacts

Like the proposed project, for all alternatives, operation would not violate a water quality standard or waste discharge requirement or otherwise substantially degrade water quality, and runoff from the alternatives would not exceed the capacity of a storm drain system or provide a substantial source of stormwater pollutants. All alternatives would be required to comply with comprehensive regulations and to implement required measures designed to reduce pollutant loading and protect water quality, thereby avoiding or minimizing water quality effects from potential sources of water pollutants associated with project operations. These potential sources include: stormwater discharges to separate stormwater system; stormwater outfall discharges to the bay; wastewater discharges to the combined sewer system; changes in combined sewer discharges; changes in bay circulation; maintenance dredging at the proposed dock; and littering. Please see Section 4.J for description of applicable regulations and how compliance with them would ensure protection of water quality. The project analysis indicated that for all of these potential sources, water quality impacts would be less than significant, both at a project-specific and cumulative level. Wastewater and stormwater infrastructure would be substantially the same under all of the alternatives, and would be appropriately sized for the anticipated discharges from the site. Stormwater discharges under all alternatives would be similar to those for the proposed project, and similarly, wastewater discharges would be the same or less under all alternatives as those for the proposed project. Therefore, potential sources of water pollutants associated with operation of all alternatives would also have a less-than-significant impact on water quality. For Alternatives A through G, like the proposed project, operational water quality impacts, both at a project-specific and cumulative level, would be ***less than significant***.

Alteration of Drainage Patterns

Like the proposed project, none of the alternatives would substantially alter the existing drainage pattern at the site. The existing grading at the site is relatively flat, and proposed changes to grading under any of the alternatives would be designed to address sea level rise but not to otherwise substantially alter the existing drainage pattern. Furthermore, neither alteration of existing drainage patterns at the project site nor changes in stormwater runoff volumes would result in substantial erosion, siltation, or flooding onsite or offsite. For Alternatives A through G, like the proposed project, this impact would be ***less than significant***, both at a project-specific and cumulative level.

Flooding

Like the proposed project, none of the alternatives would place housing within a 100-year flood zone or place structures within an existing or future 100-year flood zone that would impede or redirect flood flows. Alternative A would not include any residential uses, so there would be no impact related to housing within a 100-year flood zone. Although the shoreline portions of the project site are located within a 100-year flood zone identified on the City's 2008 Interim Flood Hazard Maps, all alternatives would include construction of shoreline protection improvements

to protect the waterfront from the damaging effects of wave action, as well. In addition, to address sea level rise, it is expected that all alternatives would raise the elevation of the entire waterfront portion of the project site above the existing 100-year flood elevation and above the projected worst-case future flood elevation. However, the final slope and shape of the shoreline along the waterfront portion of the project site would be substantially the same as under the existing conditions, and the patterns of flood flows at the project site or in the vicinity would not be substantially affected. For Alternatives A through G, like the proposed project, this impact would be ***less than significant***.

Risk of Inundation by Seiche, Tsunami, or Mudflow

The majority of the project site is located in an area identified for potential inundation in the event of a tsunami or seiche based on existing site grades. However, as described above, to address sea level rise, it is expected that all the alternatives would raise the elevation of the entire waterfront portion of the project site above the existing 100-year flood elevation and above the projected worst-case future flood elevation, which is above the maximum tsunami elevation. For Alternatives A through G, like the proposed project, this impact would be ***less than significant,*** both at a project-specific and cumulative level.

6.D.1.16 Hazards and Hazardous Materials

Project impacts related to hazards and hazardous materials are described in Chapter 4, Section 4.K. As described below, the impacts of the alternatives related to hazards and hazardous materials would be similar to the proposed project. See Section 4.K for more detailed description of the impacts.

Routine Transport, Use, or Disposal of Hazardous Materials

Like the proposed project, none of the alternatives would create a significant hazard through routine transport, use, or disposal of hazardous materials during construction or operation. As described in Section 4.K, extensive state and local regulations are in place that would require the project sponsor to implement numerous control measures to prevent the release of hazardous materials during construction and operation of any of the alternatives. These measures include: the Construction General Stormwater Permit, Erosion Control Plan, Storm Water Pollution Prevention Plan, permits for blasting, California General Industry Safety Order for Explosives, Articles 21 and 22 of the San Francisco Health Code (which provides for the safe handling of hazardous material and management of hazardous wastes), and state regulations governing transportation of hazardous materials. With compliance with applicable hazardous materials and hazardous waste regulations, like the proposed project, impacts of Alternatives A through G related to the routine use, transport, and disposal of hazardous materials would be ***less than significant***. Alternative A would include more PDR uses, which may involve routine transport, use, and disposal of hazardous materials; however, compliance with existing regulations would reduce this impact to less than significant.

Hazardous Building Materials

Like the proposed project, demolition and renovation of buildings under any of the alternatives would not expose workers or the public to hazardous building materials or result in a release of these materials into the environment. As described in Section 4.K, there is a well-established regulatory process that must be followed for ensuring adequate abatement of these materials prior to building demolition or renovation. This includes regulations governing safe removal and disposal of hazardous building materials present in structures to be demolished under all alternatives, including asbestos-containing materials, lead-based paint, and other hazardous substances. Under Alternatives B through G, like the proposed project, one or more historic structure would be retained and renovated; however, like the proposed project, any hazardous building materials present in these structures would require abatement in compliance with existing regulations prior to any renovation. Therefore, through compliance with regulatory requirements, impacts related to hazardous building materials under Alternatives A through G would be ***less than significant,*** both at a project-specific and cumulative level, similar to the proposed project.

Potential for Release of Hazardous Materials in the Power Station and PG&E Sub-areas

As described in Section 4.K, the Power Station and PG&E sub-areas portions of the project site are identified on numerous environmental databases documenting presence of hazardous materials at the site. Like the proposed project, under all alternatives, there would be a potential to encounter hazardous materials in the soil and groundwater during construction or operation that could potentially create a hazards to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

While PG&E will complete the ongoing environmental remediation for hazardous materials in soils and groundwater at the project site prior to any development, the fully remediated site will achieve a commercial/industrial land use standard, as approved by the San Francisco Regional Water Quality Control Board. This level of remediation would be adequate for Alternative A, which would include only commercial and industrial land uses within the Power Station sub-area and not the PG&E sub-area. Therefore, for Alternative A, this impact would be ***less than significant***.

However, for Alternatives B through G, like the proposed project, future uses would include residential and associated sensitive land uses such as child care facilities, and the Regional Water Quality Control Board could require additional measures to control site risks appropriate for residential uses. Therefore as directed by the regional board, the project sponsor would be required to conduct additional risk evaluations, to identify site design features to control site risks, and if necessary, to prepare and implement risk management plans. Compliance with directives by the regional board required to permit residential and associated sensitive land uses at the project site would reduce potential impacts to less than significant. It is expected that prior to development of the project site with residential and/or child care uses, the regional board would require the project sponsor to conduct a human health risk assessment for the proposed sensitive land uses and to implement site design measures to control risks related to exposure to chemicals in soil, groundwater, and soil vapors, and as approved by the regional board, and to include appropriate construction measures in the risk management plans. The project sponsor

would also be required to prepare and implement risk management plans as approved by the regional board. Therefore, for Alternatives B through G, impacts related to potential hazards to the public or environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment in the Power Station and PG&E sub-areas would be ***less than significant*** with implementation of the regulatory requirements of the regional board.

Potential for Release of Hazardous Materials in the Port, City, and Southern Sub-areas

Similar to the impact described above for the Power Station and PG&E sub-areas, for Alternatives A through G, there would be a potential to encounter hazardous materials in the soil and groundwater during construction or operation that could potentially create a hazards to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Like the proposed project, for Alternatives B through G (Alternative A would not include the western portion of the Port sub-area, these sub-areas are part of the project site and contiguous with the Power Station sub-area, and would not be developed for residential or commercial purposes, but instead the western portion of the Port sub-area and all of the City and Southern sub-areas would be covered by 23rd Street, and the shoreline portions of the Port sub-area would be public open space. These sub-areas are not subject to the deed restrictions that apply to the Power Station sub-area and are not listed on any environmental databases. However, based on their proximity to the former power plant, there is a high likelihood that similar hazardous materials are present in the soils. These soils are also known to contain naturally-occurring asbestos. Like the proposed project, development of these areas would be subject to article 22A of the San Francisco Health Code and soil disturbance activities would be subject to the requirements of the air district Asbestos Airborne Toxics Control Measure. With implementation of these regulatory requirements, impacts associated with exposure to hazardous materials in soil, groundwater, and soil vapors would be less than significant during both construction and operation. Therefore, like the proposed project, for Alternatives A through G, this impact would be ***less than significant***.

Hazardous Materials Impacts on Nearby Schools

Like the proposed project, none of the alternatives would result in adverse effects on nearby schools due to handling of hazardous or acutely hazardous materials, substances, or waste. As described in Section 4.K, the project site is located within one quarter mile of four schools. However, as described above, extensive state and local regulations are in place that would require the project sponsor to implement numerous control measures to prevent the release of hazardous materials (including acutely hazardous materials) during construction and operation of the proposed project or any of the alternatives. Therefore, for Alternatives A through G, like the proposed project, with implementation of required control measures under state and local regulations pertaining to hazardous materials, substances, and waste this impact would be ***less than significant.*** Additional analysis on the potential for toxic air contaminants to affect nearby sensitive receptors is addressed in the Air Quality section.

Risk of Fire or Interference with Emergency Response Plan

Like the proposed project, none of the alternatives would expose people or structures to a significant risk of loss, injury, or death involving fires, nor would they impair implementation of or physically interfere with an adopted emergency response or emergency evacuation plan. San Francisco ensures fire safety primarily through provisions of the San Francisco Building Code. Accordingly, the alternatives would be required to comply with the applicable sections of the building code, which require incorporation of fire safety features. Consequently, none of the alternatives would create a substantial fire hazard or increase the risk of fires above existing levels.

The City has a published Emergency Response Plan, prepared by the Department of Emergency Management as part of the City's Emergency Management Program, which includes plans for hazard mitigation and disaster preparedness and recovery. Through compliance with the existing codes and regulations and implementation of provisions for emergency response that account for and are compatible with the City's Emergency Response Plan, none of the alternatives would impair implementation of or physically interfere with and adopted emergency response or emergency evacuation plan. Therefore, like the proposed project, for Alternatives A through G, this impact would be ***less than significant***.

6.D.1.17 Mineral and Energy Resources

Like the proposed project (see initial study, Appendix B), Alternatives A through G would not result in the use of large amounts of fuel, water, or energy, or use of these materials in a wasteful manner, either at a project or cumulative level. Given compliance with applicable regulations, including the Non-potable Water Program (which requires onsite non-potable water systems to minimize wasteful use of potable water), and the Green Building Code (which requires energy efficiency measures), these impacts would be ***less than significant***.

6.D.1.18 Agricultural and Forest Resources

As described for the proposed project (see initial study, Appendix B), the project site does not contain agricultural or forest resources, nor is the site zoned or designated for agricultural, forest, or timberland uses. Therefore, development under Alternatives A through G would have ***no impact*** on these resources.

6.D.2 Comparison of Alternatives and Environmentally Superior Alternative

6.D.2.1 Comparison and Summary of Alternatives' Impacts and Ability to Meet Project Objectives

Table 6-6 compares the impacts of all seven alternatives with those of the proposed project, with a focus on the significant impacts. Less-than-significant impacts are not explicitly shown in this table since they are not considered in the alternatives analysis. Significant and unavoidable impacts are shown in **bold face** type. The impacts of each of the alternatives and their ability to meet the project objectives as compared to the proposed project are summarized below.

All of the alternatives, are considered potentially feasible for the purposes of this EIR, as required by CEQA Guidelines section 15126.6(a). With the exception of Alternative A, the No Project/Code Compliant Alternative, each of the alternatives would meet the basic project objectives, though some of the alternatives would only partially meet some of the objectives. However, in all cases, it is unknown if any of the alternatives can meet the objective that the project "create a development that is financially feasible and that can fund the project's capital costs and on-going operation and maintenance costs relating to the redevelopment and long-term operation of the property." This is because the alternatives that would reduce the overall program would be expected to generate reduced income compared to the proposed project; in addition, with the exception of Alternative A, all other alternatives would have an increased costs associated with the rehabilitation of historic structures. Together, the reduced income and the increased costs would compromise the ability of the alternatives to meet this objective. This unknown financial feasibility could affect the overall feasibility of an alternative based on "economic viability" as indicated in CEQA Guidelines section 15126.6(f)(1). The San Francisco Planning Commission will consider the actual feasibility of project alternatives, including economic feasibility, at the time of project approval.

Alternative A, No Project/Code Compliant

Alternative A would avoid or reduce some—but not all—of the significant impacts identified for the proposed project. This alternative would substantially lessen the severity of the following impacts, reducing them from significant and unavoidable with mitigation to less than significant:

- Significant and unavoidable impacts on Muni capacity, both project-specific and cumulative level, would be reduced to less than significant due to reduced number of transit trips.
- Significant and unavoidable impacts on Muni operations, both at a project-specific and cumulative level, would be reduced to less than significant due to the reduced number of vehicle trips.
- Significant and unavoidable impacts from construction-related increases in ambient noise levels to future onsite receptors would be reduced to less than significant due to the absence of residential uses on the site.
- Significant and unavoidable impacts from construction--related plus overlapping operational criteria air pollutant emissions would be reduced to less than significant with mitigation due to the 73 percent reduction in building square footage and associated reduction in vehicle trips.
- Significant and unavoidable impacts from operations-related criteria air pollutant emissions would be reduced to less than significant with mitigation due to the 73 percent reduction in building square footage and the removal of the need for emergency generators.
- Significant and unavoidable impacts from cumulative regional air quality impacts would be reduced to less than significant with mitigation due to the 73 percent reduction in building square footage and the removal of the need for emergency generators.
- Significant and unavoidable impacts from interim wind hazards would be reduced to less than significant due to the reduced building heights.

Other significant though mitigable impacts of the project that would be substantially less severe under Alternative A (i.e., impact would be reduced from less than significant with mitigation to less than significant or no impact) include the following:

- Significant but mitigable impacts on pedestrian safety and accessibility would be reduced to less than significant due to the substantial reduction in the number of people walking.
- Significant but mitigable impacts from operational onsite traffic noise would be avoided due to the absence of residential uses under Alternative A.
- Significant but mitigable health risk impacts from exposure to toxic air contaminants to onsite receptors would be avoided because there would be no residential uses.
- Significant but mitigable impacts on special status fish/marine mammals and associated wildlife movement would be reduced to less than significant because there would be no dock and no in-water pile driving that could affect special status fish/marine mammals.

In the following cases, Alternative A would reduce the severity of a significant impact of the proposed project, but not to the extent that it would be below the significance threshold and change the significance determination:

- Significant and unavoidable operational offsite traffic noise increases would be lessened compared to the project due to the reduction in vehicle trips, but the impact would still be significant and unavoidable with mitigation.
- Significant and unavoidable cumulative construction-related noise increases would be lessened compared to the project due to the reduced contribution to cumulative construction activities and construction vehicle trips, but the impact would still be significant and unavoidable with mitigation.
- Significant but mitigable construction-related vibration impacts on existing buildings would be lessened compared to the project due to the reduced amount of pile driving, but the impact would still be less than significant with mitigation.
- Significant but mitigable impacts due to exposure to operational noise levels in excess of standards would be lessened compared to the project due to the reduced amount of stationary equipment and elimination of diesel backup generators, but the impact would still be less than significant with mitigation.
- Significant but mitigable cumulative health risk to offsite receptors on the Pier 70 site would be lessened compared to the project due to the reduction in vehicle trips and elimination of backup diesel generators, but the impact would still be less than significant with mitigation.

Less-than-significant wind impacts at buildout would be lessened compared to the project due to the substantially reduced height of the buildings, but the impact would still be less than significant. However, because Alternative A would involve development on a site that is currently not in active use (other than ongoing remediation and temporary office uses) many of the same significant impacts and mitigation measures identified for the proposed project would be applicable to Alternative A.

Significant and unavoidable impacts identified for the project that would not be substantially reduced under Alternative A and would still occur include impacts on:

- Individually eligible historic resources due to demolition of Station A, the Meter House, and the Compressor House.
- Effects on Third Street Industrial District, both at a project-specific and cumulative level due to demolition of and substantial alteration to six contributors to the district.
- Construction-related increases in ambient noise levels to future Pier 70 receptors due to the proximity of those receptors.
- Operational offsite traffic noise increases would be less than under the project but would still exceed thresholds, both at a project-specific and cumulative level.
- Cumulative construction-related noise increases would be lessened compared to the project due to the reduced contribution to cumulative construction activities and construction vehicle trips, but the impact would still be significant and unavoidable with mitigation.

Significant impacts that could be mitigated to less than significant that were identified for the project and would still apply to Alternative A include impacts related to: archeological resources human remains, and tribal cultural resources; infill construction and rehabilitation effects on the Third Street Industrial District; construction and operational noise levels in excess of standards; construction vibration; project and cumulative level health risk to offsite receptors from toxic air contaminants; Clean Air Plan consistency; construction effects on nesting birds and special-status bats; jurisdictional waters; and paleontological resources.

As indicated above in Table 6-2, Alternative A would not meet the basic project objective to "redevelop the former power plant site to provide a mix of residential, retail, office, PDR, R&D space, a hotel, and activated waterfront open spaces to support a daytime population in a vibrant neighborhood retail district and to provide employment opportunities within walking distance to residents of the surrounding neighborhood." While it would provide a mix of general office, PDR, and retail uses, support a daytime population, and provide employment opportunities, the No Project/Code Compliant Alternative would not provide the full mix of diverse land uses targeted under this objective, since it would not include any residential or hotel uses or commercial uses designated for R&D/life sciences that together with office, PDR, and retail uses would constitute a "vibrant neighborhood retail district." Furthermore, Alternative A would not meet most of the other project objectives, including not increasing the city's supply of housing, not attracting a diversity of household types, not redeveloping the PG&E sub-area, not creating an iconic addition to the city's skyline or a transit-oriented development, and not constructing a waterfront hotel. However, it would partially meet some of the objectives related to providing open space and bicycle use along the waterfront, partially connecting to the Pier 70 Mixed-Use District project to form a single neighborhood, and constructing a substantial amount of PDR uses. It is assumed, however, that this alternative would meet the objectives related to resiliency to sea level rise and earthquakes and sustainable development. The financial feasibility of the No Project/Code Compliant Alternative is unknown.

Alternative B, Full Preservation/Reduced Program

Alternative B would avoid or reduce some—but not all—of the significant impacts identified for the proposed project. This alternative would substantially lessen the severity of the following impacts, reducing them from significant and unavoidable with mitigation to less than significant:

- Significant and unavoidable impacts on transit operations, both at a project-specific and cumulative level, would be reduced to less than significant due to the substantial reduction in vehicle trips.

This alternative would substantially lessen the severity of the following impacts, reducing them from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on individually eligible historic resources would be avoided by retaining and rehabilitating the onsite historic resources, and implementation of vibration monitoring and vibration control mitigation measures would reduce this impact to less than significant.
- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level would be avoided by retaining and rehabilitating the onsite historic resources, and implementation of vibration monitoring and vibration control mitigation measures would reduce this impact to less than significant.

Significant and unavoidable impacts identified for the project that would not be substantially reduced under Alternative B and would still occur include the following:

- Significant and unavoidable Muni capacity impacts, both at a project-specific and cumulative level, impacts would be less than the proposed project and reduce impacts on the 22 Fillmore route to less than significant due to the reduction in demand for transit trips, but the new transit trips would still be above thresholds on the 48 Quintara/24th Street route and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable construction-related increases in ambient noise levels to future onsite and Pier 70 receptors would be less than the proposed project due to the reduction in the magnitude of construction, but noise levels would still be above thresholds and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable operational offsite traffic noise increases would be less than the project due to the reduction in vehicle trips, but noise levels would still exceed thresholds, and the impact would remain significant and unavoidable even with mitigation, at both the project-specific and cumulative level.
- Significant and unavoidable cumulative construction-related noise increases would be lessened compared to the project due to the reduced contribution to cumulative construction activities and construction vehicle trips, but the impact would still be significant and unavoidable with mitigation.
- Significant and unavoidable impacts related to construction- and operations-related criteria air pollutant emissions would be less than the project due to the reduced square footage of development, but emission levels would still exceed thresholds, and the impact would remain significant and unavoidable even with mitigation.

- Significant and unavoidable contribution to cumulative regional air quality impacts would be less than the proposed project due to the reduced square footage of development, but emission levels would still exceed thresholds, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable interim wind hazards would occur similar to the proposed project due to the unknowns and uncertainties associated with phased construction, and the impact would remain significant and unavoidable even with mitigation.

Significant impacts that could be mitigated to less than significant that were identified for the project and would still apply to Alternative B include impacts related to: archeological resources, human remains, and tribal cultural resources; infill construction effects on Third Street Industrial District; pedestrian safety and accessibility; construction and operational noise levels in excess of standards; construction vibration; operational onsite traffic noise increases; project and cumulative level health risk from toxic air contaminants (impact would be reduced but would still require mitigation); Clean Air Plan consistency; construction effects on nesting birds, special-status bats, fish, and marine mammals; jurisdictional waters, and paleontological resources.

As indicated above in Table 6-2, Alternative B would partially meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide employment opportunities within walking distance of the surrounding neighborhood. This alternative would provide the same diverse mix of uses and employment opportunities as the proposed project, but the intensity of those uses and opportunities would be reduced by about one third. Alternative B would meet many of the project objectives, including providing access to the bay and active open space uses, attracting a diversity of household types, redeveloping the PG&E sub-area, creating a transit-oriented development, and constructing a waterfront hotel. However, it would only partially meet other objectives, including those related to increasing the city's housing supply (would provide two thirds the amount of the proposed project), connecting to the Pier 70 Mixed-Use District project due to grade changes at the Meter House and the Compressor House, and constructing a substantial amount of PDR uses (would provide two thirds the amount of the proposed project). The financial feasibility of the Full Preservation/Reduced Program Alternative is unknown.

Alternative C, Full Preservation/Similar Program

Alternative C would avoid or reduce some—but not all—of the significant impacts identified for the proposed project. This alternative would substantially lessen the severity of the following impacts, reducing them from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on individually eligible historic resources would be avoided by retaining and rehabilitating the onsite historic resources, and implementation of vibration monitoring and vibration control mitigation measures would reduce this impact to less than significant.
- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level, would be avoided by retaining and rehabilitating the onsite

historic resources, and implementation of vibration monitoring and vibration control mitigation measures would reduce this impact to less than significant.

Significant and unavoidable impacts identified for the project that would not be reduced under Alternative C and would still occur include the following:

- Significant and unavoidable Muni capacity impacts, both at a project-specific and cumulative level, would be similar to the project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable transit operations impacts, both at a project-specific and cumulative level, would be similar to the project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable construction-related increases in ambient noise levels to future onsite and Pier 70 receptors would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable operational offsite traffic noise increases, both at a project-specific and cumulative level would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable cumulative construction-related noise increases would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable construction and operations related criteria air pollutant emissions would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable cumulative regional air quality impacts would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable interim wind hazards would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.

In addition, there is the potential for Alternative C to have an additional significant and unavoidable impact associated with wind hazards at buildout, at both a project-specific and cumulative level. Although no wind-tunnel testing has been completed for this alternative, there is the likelihood that wind conditions would be more severe than those under the project because of the additional towers. Conservatively, it is assumed that Alternative C would have a significant and unavoidable wind impact at buildout, even with mitigation, and its contribution to cumulative wind impacts would also be significant and unavoidable with mitigation.

Significant impacts that could be mitigated to less than significant that were identified for the project and would still apply to Alternative C include impacts related to: archeological resources, human remains, and tribal cultural resources; infill construction effects on Third Street Industrial District; construction and operational noise levels in excess of standards; construction vibration; operational onsite traffic noise increases; project and cumulative level health risks from toxic air

contaminants; Clean Air Plan consistency; construction effects on nesting birds, special-status bats, fish, and marine mammals; jurisdictional waters, and paleontological resources.

As indicated above in Table 6-2, Alternative C would meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide employment opportunities within walking distance of the surrounding neighborhood. Alternative C would meet this objective to the same degree as the proposed project with only a slight reduction in the amount of office uses. Alternative C would meet most of the project objectives, including providing access to the bay and active open space uses, increasing the city's supply of housing, attracting a diversity of household types, redeveloping the PG&E sub-area, creating a substantial increment of new PDR uses and a transit-oriented development, and constructing a waterfront hotel. However, it would only partially meet the objectives related to connecting to the Pier 70 Mixed-Use District project due to grade changes at the Meter House and the Compressor House. The financial feasibility of the Full Preservation/Similar Program Alternative is unknown.

Alternatives D, Partial Preservation 1

Alternative D would reduce some—but not all—of the significant impacts identified for the proposed project. This alternative would substantially lessen the severity of the following impact, reducing it from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level would be reduced to less than significant with mitigation due to the retention and rehabilitation of Station A and the Boiler Stack consistent with the Secretary of Interior's Standards.

Significant and unavoidable impacts identified for the project that would not be substantially reduced under Alternative D and would still occur include the following:

- Significant and unavoidable impacts on individually eligible historic resources would be less severe than the proposed project due to the retention and rehabilitation of Station A, but the impact would still significant and unavoidable due to the demolition of the Meter House and the Compressor House.
- Significant and unavoidable Muni capacity, both at a project-specific and cumulative level, would be similar to the project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable transit operations impacts, both at a project-specific and cumulative level, would be similar to the project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable construction-related increases in ambient noise levels to future onsite and Pier 70 receptors would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.

- Significant and unavoidable operational offsite traffic noise increases both at a project-specific and cumulative level would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable cumulative construction-related noise increases would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable construction and operations related criteria air pollutant emissions would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable cumulative regional air quality impacts would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.
- Significant and unavoidable interim wind hazards would be the same as for the proposed project, and the impact would remain significant and unavoidable even with mitigation.

Significant impacts that could be mitigated to less than significant that were identified for the project and would still apply to Alternative D include impacts related to: archeological resources, human remains, and tribal cultural resources; infill construction and rehabilitation effects on Third Street Industrial District; construction and operational noise levels in excess of standards; construction vibration; operational onsite traffic noise increases; project and cumulative level health risk from toxic air contaminants; Clean Air Plan consistency; construction effects on nesting birds, special-status bats, fish, and marine mammals; jurisdictional waters, and paleontological resources.

As indicated above in Table 6-2, Alternative D would meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide employment opportunities within walking distance of the surrounding neighborhood. Alternative D would meet this to essentially the same degree as the proposed project, with a slight reduction in residential and office uses. Alternative D would meet most of the project objectives, including providing access to the bay and active open space uses, attracting a diversity of household types, redeveloping the PG&E sub-area, fully connecting to the Pier 70 Mixed-Use District project, creating a substantial increment of new PDR uses and a transit-oriented development, and constructing a waterfront hotel. However, it would only partially meet the objective related to the city's supply of housing (would provide 91 percent compared to the project). The financial feasibility of Partial Preservation 1 Alternative is unknown.

Alternatives E, Partial Preservation 2

The overall impacts of Alternative E compared to those of the proposed project would generally be the same as described above for Alternative D. Like Alternative D, this alternative would substantially lessen the severity of the following impact, reducing it from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level, would be reduced to less than significant with mitigation due to the retention and rehabilitation of the southern portion of Station A and the Boiler Stack consistent with the Secretary of Interior's Standards.

Alternative E would also partially lessen the severity of the significant and unavoidable impact on individually eligible historic resources, but not substantially enough to change the CEQA significance determination of significant and unavoidable with mitigation. All of the other impacts of Alternative E compared to those of the proposed project would be the same as described above for Alternative D.

As indicated above in Table 6-2, Alternative E would meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide employment opportunities within walking distance of the surrounding neighborhood. Alternative E would meet this to essentially the same degree as the proposed project, with a slight reduction in office uses. Alternative E would otherwise meet most of the project objectives, including providing access to the bay and active open space uses, increasing the city's supply of housing, attracting a diversity of household types, redeveloping the PG&E sub-area, fully connecting to the Pier 70 Mixed-Use District project, creating a substantial increment of new PDR uses and a transit-oriented development, and constructing a waterfront hotel. The financial feasibility of Partial Preservation 2 Alternative is unknown.

Alternative F, Partial Preservation 3

The overall impacts of Alternative F compared to those of the proposed project would be generally the same as described above for Alternative D. Like Alternative D, this alternative would substantially lessen the severity of the following impact, reducing it from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level would be reduced to less than significant with mitigation due to the retention and rehabilitation of the Meter House, Compressor House, and Boiler Stack consistent with the Secretary of Interior's Standards.

Alternative F would also partially lessen the severity of the significant and unavoidable impact on individually eligible historic resources, but not substantially enough to change the CEQA significance determinations. All of the other impacts of Alternative F compared to those of the proposed project would be the same as described above for Alternative D.

However, there is the potential for Alternative F to have two additional significant and unavoidable impacts associated with wind hazards at buildout, at both a project-specific and cumulative level. Although no wind-tunnel testing has been completed for this alternative, there is the likelihood that wind conditions would be more severe than those under the project because of the massing of the 180-foot tall building at the southwest corner of the project site at Block 5. Conservatively, it is assumed that Alternative F would have a significant and unavoidable wind impact at buildout,

even with mitigation, and its contribution to cumulative wind impacts would also be significant and unavoidable with mitigation.

As indicated above in Table 6-2, Alternative F would meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide employment opportunities within walking distance of the surrounding neighborhood. Alternative F would meet this to essentially the same degree as the proposed project, with a slight reduction in residential uses. Alternative F would otherwise meet most of the project objectives, including providing access to the bay and active open space uses, attracting a diversity of household types, redeveloping the PG&E sub-area, creating a substantial increment of new PDR uses and a transit-oriented development, and constructing a waterfront hotel. However, it would only partially meet the objectives related to the city's supply of housing (would provide 92 percent compared to the project) and connecting to the Pier 70 Mixed-Use District project due to grade changes at the Meter House and Compressor House. The financial feasibility of Partial Preservation 3 Alternative is unknown.

Alternative G, Partial Preservation 4

The overall impacts of Alternative G compared to those of the proposed project would be generally the same as described above for Alternative D. Like Alternative D, this alternative would substantially lessen the severity of the following impact, reducing it from significant and unavoidable with mitigation to less than significant with mitigation:

- Significant and unavoidable impacts on the Third Street Industrial District, both at a project-specific and cumulative level would be reduced to less than significant with mitigation due to the rehabilitation of the Boiler Stack consistent with the Secretary of Interior's Standards and the retention the façades of Station A, the Meter House, and Compressor House.

Alternative G would also partially lessen the severity of the significant and unavoidable impact on individually eligible historic resources, but not substantially enough to change the CEQA significance determinations. All of the other impacts of Alternative G compared to those of the proposed project would be the same as described above for Alternative D.

However, there is the potential for Alternative G to have two additional significant and unavoidable impacts associated with wind hazards at buildout, at both a project-specific and cumulative level. Although no wind-tunnel testing has been completed for this alternative, there is the likelihood that wind conditions would be more severe than those under the project because of the massing of the 180-foot tall building at the southwest corner of the project site at Block 5. Conservatively, it is assumed that Alternative G would have a significant and unavoidable wind impact at buildout, even with mitigation, and its contribution to cumulative wind impacts would also be significant and unavoidable with mitigation.

As indicated above in Table 6-2, Alternative G would meet the basic project objective of redeveloping the former power plant site with a mix of residential, commercial, and open space uses to support a daytime population in a vibrant neighborhood district and to provide

employment opportunities within walking distance of the surrounding neighborhood. Alternative G would meet this to essentially the same degree as the proposed project, with a slight reduction in residential and office uses. Alternative G would otherwise meet most of the project objectives, including providing access to the bay and active open space uses, attracting a diversity of household types, redeveloping the PG&E sub-area, creating a substantial increment of new PDR uses and a transit-oriented development, and constructing a waterfront hotel. However, it would only partially meet the objective related to the city's supply of housing (would provide 93 percent compared to the project) and connecting to the Pier 70 Mixed-Use District project due to grade changes at the Meter House and Compressor House. The financial feasibility of Partial Preservation 4 Alternative is unknown.

6.D.2.2 Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative to the proposed project (section 15126.6[e]). Based on the analysis and comparison of the impacts of the alternatives presented above, this subsection identifies Alternative A as the environmentally superior alternative. As described above, Alternative A (No Project/Code Compliant Alternative) would substantially lessen the severity of the significant and unavoidable impacts of the proposed project and would reduce impacts related to transit capacity and operations, construction noise, construction and operational air quality, cumulative regional air quality, and interim wind hazards to less than significant. This alternative would also avoid significant but mitigable impacts related to onsite traffic noise and onsite health risk due to the absence of onsite residential uses. It would also lessen the severity of impacts related to offsite traffic noise increases, construction vibration, operational noise levels, cumulative health risks, and wind conditions at buildout, but not to the extent that it would be below the significance threshold and change the significance determination. However, significant and unavoidable impacts of the proposed project related to individual historic resources, the Third Street Industrial District, construction noise to future Pier 70 receptors, and operational traffic noise increases would still be expected to occur under this alternative. While Alternative A would offer some environmental advantage over the proposed project, significant and unavoidable adverse impacts would still occur. CEQA Guidelines section 15126.6(e)(2) provides that if the "no project" alternative is the environmentally superior alternative, the EIR should also identify an environmentally superior alternative among the other alternatives.

Alternatives F and G (Partial Preservation Alternatives 3 and 4) would substantially lessen the severity of the two significant and unavoidable impacts of the proposed project related to the project-specific and cumulative impacts on the integrity of the Third Street Industrial District as a historical resource under CEQA, reducing these impacts to less than significant with mitigation. However, all other significant and unavoidable impacts of the project related to individual historic architectural resources, Muni ridership and operations, construction and operational noise, construction and operational air quality, and interim wind hazards would still occur under these two alternatives. In addition, Alternatives F and G could result in an additional significant and unavoidable impact on wind hazards at buildout as well as a significant and unavoidable contribution to cumulative wind impacts, neither of which would occur under the proposed project. Therefore, due to the minimal reduction in impacts of the proposed project and the

additional new significant and unavoidable impacts, these alternatives would offer no environmental advantage over the proposed project, and Alternatives F and G are not identified as the environmentally superior alternative.

Alternatives D and E (Partial Preservation Alternative 1 and 2) would also substantially lessen the severity of the two significant and unavoidable impacts of the proposed project related to the project-specific and cumulative impacts on the integrity of the Third Street Industrial District as a historical resource under CEQA, reducing the impact to less than significant with mitigation. However, although some of the adverse impacts to historical resources would be somewhat reduced in severity, all other significant and unavoidable impacts of the project related to individual historic architectural resources, Muni ridership and operations, construction and operational noise, construction and operational air quality, and interim wind hazards would still occur under this alternative. Therefore, due to the minimal reduction in impacts of the proposed project, this alternative would offer little environmental advantage over the proposed project, and Alternatives D and E are not identified as the environmentally superior alternative.

Alternatives B and C, both full preservation alternatives, would substantially lessen the severity of the significant and unavoidable impacts of the proposed project related to individually eligible historic resources as well as to the project-specific and cumulative impacts on the integrity of the Third Street Industrial District as a historical resource under CEQA. However, Alternative C would not reduce the project-specific or cumulative impact related to transit operations, and both impacts would remain significant and unavoidable with mitigation. Alternative C also has the potential to result in an additional significant and unavoidable impact related to wind hazards at buildout, which would not occur under the proposed project. Significant and unavoidable impacts of the project related to Muni ridership, construction and operational noise increases, and construction and operational criteria air pollutant emissions would still occur under both of these alternatives, although the severity of the impacts would be less under Alternative B compared to both the proposed project and Alternative C. Therefore, although it would offer some environmental advantage over the proposed project, Alternative C is not identified as the environmentally superior alternative.

Therefore, among all of the alternatives including the "no project" alternative, Alternative B (Full Preservation/Reduced Program Alternative) is considered the environmentally superior alternative. Alternative B would eliminate the significant and unavoidable impacts related to individually eligible historic resources, effects on the Third Street Industrial District, and transit operations that would occur under the proposed project. Even though some significant and unavoidable impacts would still occur under Alternative B, this alternative would lessen the severity of the significant adverse impacts related to transit capacity, construction and operational noise, and construction and operational criteria air pollutant emissions, pedestrian safety and accessibility, and health risk from exposure to toxic air contaminants when compared to the impacts of the proposed project. Overall, Alternative B would meet most of the basic project objectives and would result in fewer and less severe environmental impacts than the proposed project or any of the other alternatives.

TABLE 6-6
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Impact of Proposed Project [1]	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Land Use							
All impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project
Population and Housing							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Cultural Resources							
Impact CR-1: Archeological resources (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact CR-2: Human remains (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact CR-3: Tribal cultural resources (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact CR-4: Historic architecture, individual resources (SUM)	**Same as project, SUM**	LSM	LSM	**Less than project but still SUM**	**Less than project but still SUM**	**Less than project but still SUM**	**Less than project but still SUM**
Impact CR-5: Demolition and alteration effects on Third Street Industrial District (SUM)	**Same as project, SUM**	LSM	LSM	LSM	LSM	LSM	LSM
Impact CR-6: Infill construction effects on Third Street Industrial District (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact C-CR-2: Cumulative effects on Third Street Industrial District (SUM)	**Same as project, SUM**	LSM	LSM	LSM	LSM	LSM	LSM
Transportation and Circulation							
Impact TR-4: Muni ridership (SUM)	LTS	**Less than project but still SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**
Impact TR-5: Muni operations (SUM)	LTS	LTS	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact TR-7: Pedestrian safety and accessibility impacts (LSM)	LTS	Similar to project (LSM)	Similar to project (LSM)	Similar to project (LSM)	Similar to project (LSM)	Similar to project (LSM)	Similar to project (LSM)

TABLE 6-6 (CONTINUED)
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Impact of Proposed Project [1]	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Transportation and Circulation (cont.)							
Impact C-TR-4: Cumulative Muni ridership (SUM)	LTS	**Less than project but still SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**
Impact C-TR-5: Cumulative transit operations (SUM)	LTS	LTS	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**	**Similar to project, SUM**
All other transportation impacts LTS	Similar to or less than project	Similar to or less than project	Similar to project	Similar to project	Similar to project	Similar to project	Similar to project
Noise and Vibration							
Impact NO-1: Exposure to construction-related noise levels in excess of standards (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact NO-2: Construction-related increases in ambient noise levels at noise-sensitive receptors (SUM)	**Less than project but still SUM** (impacts on future Pier 70 receptors, only and shorter duration)	**Less than project but still SUM** (fewer receptors and shorter duration)	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**
Impact NO-4: Construction-related vibration impacts on existing buildings (LSM)	Less than project but still LSM	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact NO-5: Exposure to operational noise levels in excess of standards (LSM)	Same or less than project (LSM)	Same or less than project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact NO-8: Operational offsite traffic noise increases (SUM)	**Less than project but still SUM** (fewer affected roadway segments)	**Less than project but still SUM** (fewer affected roadway segments)	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact C-NO-1: Cumulative construction traffic noise increases (SUM)	**Less than project but still SUM**	**Less than project but still SUM**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact C-NO-2: Cumulative operational traffic noise increases (SUM)	**Less than project but still SUM**	**Less than project but still SUM**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
All other noise impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project

TABLE 6-6 (CONTINUED)
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Impact of Proposed Project [1]	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Air Quality							
Impact AQ-2: Construction-related plus overlapping operational criteria air pollutant emissions. (SUM)	LSM	**Less than project but still SUM**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact AQ-3: Operations-related criteria air pollutant emissions. (SUM)	LSM	**Less than project but still SUM**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact AQ-4: Toxic air contaminants, cancer risk and PM2.5 concentration at offsite receptors and onsite receptors (LSM)	Offsite (LSM) Onsite (NI)	Less than project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact AQ-5: Clean Air Plan consistency (LSM)	Similar to project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact C-AQ-1: Cumulative regional air quality (SUM)	LSM	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**	**Same as project (SUM)**
Impact C-AQ-2: Cumulative health risk (LSM)	Less than project (LSM)	Less than project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
All other air quality impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project
Greenhouse Gas Emissions							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Wind and Shadow							
Impact WS-1. Wind impacts at buildout (LTS)	Less than the project	Same as or less than project	**SUM (conservative in the absence of testing)**	Similar to the project	Same as project	**SUM (conservative in the absence of testing)**	**SUM (conservative in the absence of testing)**
Impact WS-2. Interim wind hazards or changes in building layout or massing (SUM)	LTS	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**	**Same as project, SUM**
Impact C-WS-1. Cumulative wind impacts (LTS)	Less than the project	Same as or less than project	**SUM (conservative in the absence of testing)**	Similar to the project	Same as project	**SUM (conservative in the absence of testing)**	**SUM (conservative in the absence of testing)**

TABLE 6-6 (CONTINUED)
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Impact of Proposed Project [1]	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Wind and Shadow (cont.)							
All shadow impacts LTS	Less than the project	Less than the project	Slightly more than the project but still LTS	Similar to the project	Same as project	Similar to the project	Similar to the project
Recreation							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Utilities and Service Systems							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Public Services							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Biological Resources							
Impact BI-1: Construction impacts on nesting birds (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact BI-3: Construction impacts on special-status bats (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact BI-4: Construction impacts on special-status fish and marine mammals (LSM)	LTS (no dock, so no in-water pile driving)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact BI-7: Construction impacts on jurisdictional waters (LSM)	Same as or less than project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact BI-9: Construction impacts on wildlife movement, nesting birds and marine species (LSM)	Same as project (LSM, nesting birds only)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Impact C-BI-1: Cumulative impacts, nesting birds, special-status bats, marine species, and jurisdictional waters (LSM)	Same as project (LSM, nesting birds only)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
All other impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project

TABLE 6-6 (CONTINUED)
COMPARISON OF ENVIRONMENTAL IMPACTS OF THE PROJECT TO IMPACTS OF THE ALTERNATIVES

Impact of Proposed Project [1]	Alternative A: No Project/ Code Compliant	Alternative B: Full Preservation/ Reduced Program	Alternative C: Full Preservation/ Similar Program	Alternative D: Partial Preservation 1	Alternative E: Partial Preservation 2	Alternative F: Partial Preservation 3	Alternative G: Partial Preservation 4
Geology, Soils, and Paleontological Resources							
All geologic hazards impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project
Impact GE-6: Paleontological resources (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)	Same as project (LSM)
Hydrology and Water Quality							
All impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project
Hazards and Hazardous Materials							
All impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project
Mineral and Energy Resources							
All impacts LTS	Same as or less than project	Same as or less than project	Same as project	Same as project	Same as project	Same as project	Same as project
Agriculture and Forest Resources							
All impacts LTS	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project	Same as project

[1] See Chapter 4 for complete impact statements. CEQA significance determination: NI = No Impact; LTS = Less than significant; LSM = Less than significant with mitigation; SUM = Significant and unavoidable with mitigation; SU = Significant and unavoidable.

All SUM and SU impacts are shown in **bold**.

Dark shading indicates a substantial change in impact significance from the proposed project, from SU or SUM to LTS. Medium shading indicates a noticeable change in impact significance from the proposed project, from SUM to LSM or from LSM to LTS. Light shading indicates a slight change in impact severity from the proposed project but no change in significance determination.

6.E Alternatives Considered but Rejected

In developing the proposed project, the project sponsor considered multiple alternative concepts/designs for development of the project site, including numerous variations on preservation alternatives. The Planning Department reviewed these alternative concepts as potential strategies for reducing or avoiding the significant adverse impacts that were identified for the proposed project. In most cases, the alternative concepts were incorporated into one or more of the seven alternatives selected and analyzed in Section 6.D, above. In some cases, however, alternative concepts were determined to either be infeasible, result in the same or more severe environmental impacts compared to those of the project, or already covered within the range of selected alternatives. The alternatives considered but rejected and the reasons they have been rejected from further analysis are described below.

6.E.1 Alternatives Identified During Scoping

During the scoping process for the EIR, several individuals raised a concern regarding the need to consider alternatives to the proposed project as summarized in Chapter 1, Table 1-1. The concepts raised during scoping included: (1) a reduced height and density alternative; (2) preservation, restoration, and adaptive reuse of historic buildings; (3) a low elevation, no height rezoning alternative with mixed use limited to residences, PDRs, and local-servicing businesses; and (4) a no-office, no-hotel alternative. Three of these concepts have been incorporated into the selected alternatives and are analyzed in Section 6.D, above. The first concept is addressed under Alternative B, Full Preservation/Reduced Program Alternative; the second concept is addressed under Alternatives B through G, Full and Partial Preservation alternatives; and the third concept is addressed under Alternative A, No Project/Code Compliant Alternative. The fourth concept was considered but rejected, as discussed below.

6.E.2 Alternatives Considered but Rejected

6.E.2.1 Alternative Location

CEQA Guidelines section 15126.6(f)(2) states that alternative locations should be considered if they would avoid or substantially lessen any of the significant effects. While an alternative location might avoid the impacts associated with demolition of historic resources, the Planning Department has concluded that no feasible alternative locations exist. No comparable parcel of land is available along the bay shoreline to which the project sponsor could reasonably acquire, control, or otherwise have access. Therefore, this concept was rejected from further consideration.

Other Preservation Alternatives

A preservation alternatives report was prepared in March 2018 consistent with guidance provided by San Francisco's Historic Preservation Commission.[11] The report presents full and

[11] Page & Turnbull, *Potrero Power Station Mixed-Used Development Project Preservation Alternatives Report*, March 9, 2018.

partial preservation alternatives that were developed, collaboratively by the project sponsor, Page & Turnbull, and Planning Department staff. The report identifies four partial preservation alternatives upon which Alternatives D, E, F, and G are based. The report also includes a number of other alternatives that were considered but rejected for the reasons presented below:

- **No Project Alternative from Preservation Alternatives Report**. This alternative consists of no new construction on the project site and retention of all existing buildings, including the historic buildings. The Planning Department rejected this alternative because it does not realistically depict reasonably foreseeable future conditions at the project site, given the location and value of the property. Instead, the Planning Department determined that Alternative A (No Project/Code Compliant) would more appropriately represent what would happen at the project site if the proposed project were not approved, and that Alternative A would satisfy the CEQA requirements for analyzing no project conditions.

- **Full Preservation Alternative from Preservation Alternatives Report.** This alternative consisted of rehabilitation of all six historic buildings on the project site and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. This alternative included a reduced number of residential dwelling units (2,270 compared to 2,682 for the project). This alternative is similar to the two full preservation alternatives analyzed in section 6.D above. The Planning Department determined that Alternative B (Full Preservation/Reduced Program) and Alternative C (Full Preservation/ Similar Program) adequately represent the range of environmental impacts that could be expected under this preservation scenario such that this alternative would be unnecessary. Therefore, this alternative was rejected from further consideration.

- **Full Preservation Alternative A from Preservation Alternatives Report**. Similar to the Full Preservation Alternative, above, this alternative consisted of rehabilitation of all six historic buildings on the project and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. This alternative included a reduced number of residential dwelling units (2,663 compared to 2,682 for the project). This alternative is similar to the two full preservation alternatives analyzed in section 6.D above. The Planning Department determined that Alternative B (Full Preservation/Reduced Program) and Alternative C (Full Preservation/ Similar Program) adequately represent the range of environmental impacts that could be expected under this preservation scenario such that this alternative would be unnecessary. Therefore, this alternative was rejected from further consideration.

- **Full Preservation Alternative B from Preservation Alternatives Report**. Similar to the Full Preservation Alternative above, this alternative consisted of rehabilitation of all six historic buildings on the project and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. This alternative included a reduced number of residential dwelling units (2,140 compared to 2,682 for the project) and a reduced amount of open space (18 percent open space compared to 22 percent for the project). This alternative is similar to the full preservation alternatives analyzed in section 6.D above. The Planning Department determined that Alternative B (Full Preservation/Reduced Program) and Alternative C (Full Preservation/Similar Program) adequately represent the range of environmental impacts that could be expected under this preservation scenario. Further, the reduction in open space component under this alternative would not reduce any significant impacts of the proposed project. Therefore, this alternative was rejected from further consideration.

- **Partial Preservation Alternative A from Preservation Alternatives Report**. This alternative consisted of rehabilitation of Station A and the Boiler Stack, retention of the Unit 3 Power Block, and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. While similar to Alternative D analyzed in section 6.D above, this alternative included a 180-foot tall building on Block 13B (instead of 85 feet tall for the project and for Alternative D). This variation from the project and Alternative D would not serve to reduce any significant impacts of the project. Therefore, the Planning Department determined that Alternative D (Partial Preservation 1) would adequately represent the range of environmental impacts that could be expected under this preservation scenario, and this alternative was rejected from further consideration.

- **Partial Preservation Alternative B from Preservation Alternatives Report**. This alternative consisted of rehabilitation of the Meter House, the Compressor House, and the Boiler Stack, retention of the Unit 3 Power Block, and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. While similar to Alternative F analyzed in section 6.D above, this alternative included a 240-foot tower on Block 13B (compared to 85 feet tall for the project and Alternative F). This variation from the project and Alternative F would not serve to reduce any significant impacts of the project. Therefore, the Planning Department determined that Alternative F (Partial Preservation 3) would adequately represent the range of environmental impacts that could be expected under this preservation scenario, and this alternative was rejected from further consideration.

- **Partial Preservation Alternative C from Preservation Alternatives Report**. This alternative consisted of retaining and building within the façades of the Meter House and the Compressor House, constructing a glass wall to envelope the historic façades of Station A and new construction above Station A, rehabilitation of the Boiler Stack, retention of Unit 3 Power Block, and development of a mix of residential, office, hotel, retail, parking, and open spaces similar to the proposed project. While similar to Alternative G analyzed in Section 6.D above, this alternative included a glass wall of new construction to envelope the historic façades of Station A to provide more usable floor plates. This variation from the project and Alternative G would not serve to reduce any significant impacts of the project. Therefore, the Planning Department determined that Alternative G (Partial Preservation 4) would adequately represent the range of environmental impacts that could be expected under this preservation scenario, and this alternative was rejected from further consideration.

- **Other Partial Preservation Alternatives from Preservation Alternatives Report**. One partial preservation concept considered consisted of rehabilitating and/or relocating only the Gate House; this concept was rejected because it would not avoid or lessen significant impacts to historic resources on the site and because it would mitigate significant impacts to a lesser extent than partial preservation Alternatives D, E, F, and G. Another concept considered would retain the exterior character-defining features of the Compressor House and the Meter House, but would relocate the buildings elsewhere on the project site; this concept was rejected because the feasibility of relocating either of these masonry buildings is unknown due to site constraints and their deteriorated condition such that rehabilitating the relocated structures to Secretary of Interior's standard is questionable. Therefore, these concepts were rejected from further consideration because they would not avoid or lessen significant impacts to historic resources on the site, would mitigate significant impacts to a lesser extent than partial preservation Alternatives D, E, F, and G, and/or would not be feasible.

6.E.2.2 No Office, No-Hotel Alternative

This concept was raised during the scoping period for the EIR and was suggested in the context of concerns with housing/jobs balance and the lack of housing in San Francisco. This concept was rejected because it would not reduce identified significant environmental impacts of the proposed project. However, the proposed project, as well as Alternative C (Full Preservation/Similar Program) and Alternative E (Partial Preservation 2) would aim to maximize housing on the project site; in addition, Alternative A (No Project/Code Compliant) would not include any hotel uses. (For concerns regarding housing/jobs balance, see Chapter 4, section 4.C.)

6.E.2.3 Design Alternatives

As part of project development, the project sponsor considered numerous design and layout concepts for the project site. As none of these concepts were developed for the purpose of reducing significant environmental impacts, the San Francisco Planning Department did not consider these preliminary design concepts as alternatives as part of the CEQA environmental review.

This page intentionally left blank

CHAPTER 7
Report Preparers

7.A San Francisco Planning Department

Environmental Planning Division
1650 Mission Street, Suite 400
San Francisco, CA 94103

- Environmental Review Officer: Lisa Gibson
- Principal Environmental Planner: Chris Kern
- Senior Environmental Planner: Rachel Schuett
- Archeologist/Preservation Planner: Pilar LaValley and Allison Vanderslice
- Transportation Planner: Manoj Madhavan, Jenny Delumo, and Sherie George
- Air Quality: Jessica Range and Josh Pollak
- Water Supply Assessment: Chris Thomas
- Noise: Jessica Range and Chris Thomas

7.B Environmental Consultant

Environmental Science Associates (ESA)
(Prime Environmental Consultant)
550 Kearny Street, Suite 800
San Francisco, CA 94108

- Paul Mitchell, Project Manager
- Terri Avila, Principal-In-Charge
- Jennifer Brown, Deputy Project Manager
- Karl Heisler
- Chris Sanchez
- Brian Pittman
- Rachel Haines
- Garrett Leidy
- Matthew Russell
- Heidi Koenig
- Johanna Kahn
- Logan Sakai
- Lisa Laxamana

Orion Environmental Associates
(Sub Consultant)
550 Kearney Street
San Francisco, CA 94108

- Joyce Hsiao, Project Director
- Valerie Geier
- Mary McDonald

HyrdoConsult Engineers (Sub Consultant)
45 Polk Street #3
San Francisco, CA 941028

- Beth Goldstein

LCW Consulting (Sub Consultant)
3990 20th Street
San Francisco, CA 94104

- Luba Wyznyckyj

Ramboll-Environ (Sub Consultant)
201 California Street, Suite 1200
San Francisco, CA 94111

- Michael Keinath
- David Kim
- Akshay Ashok

RWDI (Sub Consultant)
600 Southgate Drive
Guelth, ON, Canada N1G 4P6

- Dan Bacon
- Adriana Costa

PreVision Design (Sub Consultant)
995 Market Street, 2nd Floor
San Francisco, CA 94103

- Adam Phillips

Adavant Consulting (Sub Consultant)
200 Francisco Street, 2nd floor
San Francisco, CA 941233

- José Farrán

Fehr & Peers (Sub Consultant)
332 Pine Street, 4th Floor
San Francisco, CA 94104

- Eric Womeldorff
- Andy Kosinksi

7.C Project Sponsor/Architect

California Barrel Company LLC
1201-A Illinois Street
San Francisco, CA 94107

- Enrique Landa
- Erin Epperson
- Charles Thornton

Paul Hastings LLP
101 California Street, 48th Floor
San Francisco, CA 94111

- Gordon Hart

Perkins + Will Architects
2 Bryant Street, Suite 300
San Francisco, CA 94105

- Kristen Hall
- Greg Johnson

J. Abrams Law, P.C.
One Maritime Plaza, Suite 1900
San Francisco, CA 94111

- James Abrams
- Dana Lovisolo