PUBLIC DRAFT ENVIRONMENTAL IMPACT REPORT

SFPUC Southern Skyline Boulevard Ridge Trail Extension Project

PLANNING DEPARTMENT
CASE NO. 2016-016100ENV

STATE CLEARINGHOUSE NO. 1998082030

	Draft EIR Publication Date:	**June 24, 2020**
	Draft EIR Public Hearing Date:	**July 23, 2020**
	Draft EIR Public Comment Period:	**June 25, 2020 to August 10, 2020**

SAN FRANCISCO PLANNING DEPARTMENT

Written comments should be sent to:

Timothy Johnston, Senior Environmental Planner | 1650 Mission Street, Suite 400 | San Francisco, CA 94103 (or by email to timothy.johnston@sfgov.org)

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SAN FRANCISCO
PLANNING DEPARTMENT
1650 Mission Street, Suite 400 • San Francisco, CA 94103 • Fax (415) 558-6409

NOTICE OF PUBLIC HEARING

AND AVAILABILITY OF A DRAFT ENVIRONMENTAL IMPACT REPORT

Hearing Date:	**Thursday, July 23, 2020**
Time:	**Not before 1:00 PM**
Location:	**Visit www.sfplanning.org for details**
Case Type:	**Environmental (Draft Environmental Impact Report)**
Hearing Body:	**Planning Commission**

PROPERTY INFORMATION	APPLICATION INFORMATION
Project Address: n/a Cross Street(s): State Route 92/State Route 35 Block /Lot No.: Various Zoning District(s): Various Plan Area: SFPUC Peninsula Watershed	Case No.: 2016-016100ENV Building Permit: Not Applicable Applicant/Agent: SFPUC Scott MacPherson, Environmental Project Manager Telephone: (415) 551-4525 E-Mail: smacpherson@sfwater.org

PROJECT DESCRIPTION

A Draft environmental impact report (EIR) has been prepared by the San Francisco Planning Department in connection with this project.

The project sponsor, the San Francisco Public Utilities Commission (SFPUC), proposes to improve and develop recreational trails and associated facilities located within the Peninsula Watershed in central San Mateo County. The Peninsula Watershed property is owned by the City and County of San Francisco and managed by the SFPUC. The project is a component of the SFPUC's Peninsula Watershed Management Plan. The project area includes watershed lands along the Fifield-Cahill ridge trail, which is approximately 1.5 miles north of the State Route 92 (S.R. 92)/State Route 35 (S.R. 35) intersection (north of the Skylawn Memorial Park), and watershed lands extending south from S.R. 92 approximately 6 miles to the Phleger Estate boundary and east from S.R. 35 a few hundred feet.

Primary project components proposed for areas north of S.R. 92 include a new 0.5-mile universal access loop trail (that would provide Americans with Disabilities Act-compliant access and parking), and a 50-car parking lot and restroom near the watershed's Cemetery Gate, as well as the transfer of a public access easement (from the Bay Area Ridge Trail Council to the SFPUC) along an existing segment of the Bay Area Ridge Trail through Skylawn Memorial Park. Project components proposed for areas south of S.R. 92 include a new 6-mile southern skyline ridge trail along S.R. 35, a 20-car parking lot, and two restrooms. Along the proposed southern skyline ridge trail, the SFPUC would install a prefabricated bridge to span a gulch that intersects the trail alignment.

The SFPUC is considering multiple public access program configurations with differing levels of restrictiveness. These access programs would apply to existing and new trail areas north and south of State Route 92, and cover a range of potential access controls – from supervised to unsupervised.

The project site is not included on any of the lists compiled pursuant to Section 65962.5 of the California Government Code.

中文詢問請電: **(415) 575-9010**

Para información en Español llamar al: **(415) 575-9010**

DRAFT EIR: The Draft EIR finds that implementation of the project could result in significant unavoidable project-level impacts related to biological resources and transportation and circulation. The Draft EIR provides a detailed project description, an analysis of physical environmental effects of the project, and identification of feasible mitigation measures and alternatives that would avoid or lessen the severity of project impacts. It is available for public review and comment on the San Francisco Planning Department's website at https://sfplanning.org/environmental-review-documents

The purpose of the public hearing is for the Planning Commission and Department staff to receive comments on the adequacy and accuracy of the EIR. The Planning Commission will not respond to any of the comments or take action on the project at this hearing. Please be advised that due to the COVID-19 emergency, the Planning Commission may be required to conduct this hearing remotely. Additional information may be found on the Department's website at www.sfplanning.org. Certification of the Final EIR will be considered at a later hearing. Contact the planner below if you wish to be on the mailing list for future notices.

NOTE: This notice is being issued during the 60-day suspension of certain CEQA filing and posting requirements pursuant to Executive Order N-54-20, and its issuance complies with the alternative posting requirements stated in the order. This notice also complies with local requirements under the March 23, 2020 Fifth Supplement to the Mayoral Proclamation Declaring the Existence of a Local Emergency Dated February 25, 2020.

Public comments on the Draft EIR will be accepted from Thursday, June 25, 2020 to 5:00 p.m. on Monday, August 10, 2020.

FOR MORE INFORMATION OR TO SUBMIT COMMENTS ON THE EIR, PLEASE CONTACT:

Planner: Timothy Johnston **Telephone: (415) 575-9035** **E-Mail: timothy.johnston@sfgov.org**

GENERAL INFORMATION ABOUT PROCEDURES

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

Only commenters on the Draft EIR will be permitted to file an appeal of the certification of the final EIR to the Board of Supervisors.

A USB or paper copy of the Draft EIR will be mailed upon request. Referenced materials will also be made available for review upon request. Please contact the project planner, Timothy Johnston, at timothy.johnston@sfgov.org or (415) 575-9035. Written comments should be addressed to Timothy Johnston, San Francisco Planning Department, 1650 Mission Street, Suite 400, San Francisco, CA 94103, or emailed to **timothy.johnston@sfgov.org**. At the close of the public review period, the San Francisco Planning Department will prepare a Responses to Comments document to respond to all comments on the Draft EIR presented at the public hearing and received in writing during the public review period.

SAN FRANCISCO
PLANNING DEPARTMENT

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DATE: June 24, 2020

TO: Distribution List for the Southern Skyline Boulevard Ridge Trail Extension Project Draft EIR

FROM: Lisa Gibson, Environmental Review Officer

SUBJECT: Request for the Final Environmental Impact Report for the Southern Skyline Boulevard Ridge Trail Extension Project (Planning Department File No. 2016-016100ENV)

This is the Draft of the Environmental Impact Report (EIR) for the Southern Skyline Boulevard Ridge Trail Extension Project. A public hearing will be held on the adequacy and accuracy of this document. After the public hearing, our office will prepare and publish a document titled "Responses to Comments," which will contain a summary of all relevant comments on this Draft EIR and our responses to those comments. It may also specify changes to this Draft EIR. Those who testify at the hearing on the Draft EIR will automatically receive a copy of the Responses to Comments document, along with notice of the date reserved for certification; others may receive a copy of the Responses to Comments and notice by request or by visiting our office. This Draft EIR together with the Responses to Comments document will be considered by the Planning Commission in an advertised public meeting and will be certified as a Final EIR if deemed adequate.

After certification, we will modify the Draft EIR as specified by the Responses to Comments document and print both documents in a single publication called the Final EIR. The Final EIR will add no new information to the combination of the two documents except to reproduce the certification resolution. It will simply provide the information in one document, rather than two. Therefore, if you receive a copy of the Responses to Comments document in addition to this copy of the Draft EIR, you will technically have a copy of the Final EIR.

We are aware that many people who receive the Draft EIR and Responses to Comments have no interest in receiving virtually the same information after the EIR has been certified. To avoid expending money and paper needlessly, we would like to send copies of the Final EIR in Adobe Acrobat format on a USB drive to private individuals only if they request them. Therefore, if you would like a copy of the Final EIR, please fill out and mail the postcard provided inside the back cover to the Environmental Planning division of the Planning Department within two weeks after certification of the EIR. Any private party not requesting a Final EIR by that time will not be mailed a copy. Public agencies on the distribution list will automatically receive a copy of the Final EIR.

Thank you for your interest in this project.

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ACRONYMS AND ABBREVIATIONS

BAAQMD	Bay Area Air Quality Management District
BP	before present
Caltrans	California Department of Transportation
CalFire	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
C-APE	CEQA Area of Potential Effects
CD	State of California Delisted
CE	State of California listed as Endangered
CEQA	California Environmental Quality Act
CFP	State of California Fully Protected Species
CHS	CHS Consulting Group
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2e	carbon dioxide-equivalent
CSC	California Species of Special Concern
dBA	A-weighted decibel
EIR	environmental impact report
ERO	Environmental Review Officer
ESA	Environmental Science Associates
°F	degrees Fahrenheit
FD	Federally Delisted
FE	Federally listed as Endangered
FEMA	Federal Emergency Management Agency
FT	Federally listed as Threatened
G	Global rank indicating sensitive natural community (rank G1, G2, or G3)
GGNRA	Golden Gate National Recreation Area
GHG	greenhouse gas
I-280	Interstate 280
L_{dn}	day-night noise level
L_{eq}	equivalent steady-state noise level
L_{max}	root mean squared maximum level of a noise source or environment
LOS	Level of Service

LS	Less than Significant Impact, no mitigation required
LSM	Less than Significant Impact with Mitigation
MT	metric tons
M_w	moment magnitude scale
NOP	Notice of Preparation
NO	nitric oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
PG&E	Pacific Gas and Electric Company
PM	Particulate matter
ppm	parts per million
RM	Resource Management
ROG	reactive organic gases
S	State rank indicating sensitive natural community (rank S1, S2, or S3)
SA	CDFG Special Animal
SFGS	San Francisco Garter Snake
SFPUC	San Francisco Public Utilities Commission
S.R. 35	State Route 35
S.R. 92	State Route 92
SO_2	sulfur dioxide
SSBRTE	Southern Skyline Boulevard Ridge Trail Extension
SUM	Significant and Unavoidable Impact with Implementation of Mitigation
TAC	toxic air contaminant
$\mu g/m^3$	micrograms per cubic meter
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
VdB	vibration decibels
WL	Watch List

SUMMARY

S.1 Introduction

This document is a draft environmental impact report (EIR) for the proposed Southern Skyline Boulevard Ridge Trail Extension Project ("project"). This chapter of the EIR provides a summary of the project; anticipated environmental impacts of the project and recommended mitigation measures; areas of controversy to be resolved; and alternatives, including the environmentally superior alternative.

The project sponsor, the San Francisco Public Utilities Commission (SFPUC), proposes to improve and develop recreational trails and associated facilities located within the Peninsula Watershed in San Mateo County, which is under the jurisdiction of the SFPUC. The project is a component of the SFPUC's Peninsula Watershed Management Plan, which includes goals, policies, and actions that are designed to guide SFPUC management of resources, infrastructure, facilities, and public access within the agency's watershed lands.

Under the San Francisco Administrative Code, chapter 31, the San Francisco Planning Department's Environmental Planning section is responsible for conducting the environmental review of all City and County of San Francisco projects pursuant to the requirements of the California Environmental Quality Act (CEQA). The planning department is the lead agency responsible for preparing this EIR in compliance with CEQA, and the SFPUC is the project sponsor proposing to implement the project.

In 2001, the San Francisco Planning Commission certified an EIR analyzing the physical environmental effects of the management plan's implementation (management plan EIR).[1] The SFPUC subsequently approved the management plan. The project is among the actions identified in the management plan and evaluated in the management plan EIR at a concept, or program-level of detail. The SFPUC has since further defined the project, thus allowing for a more detailed, or project-level, analysis of potential impacts. This EIR has been prepared for the public and decision-makers to disclose the potential project-level physical impacts of the Southern Skyline Boulevard Ridge Trail Extension Project, so that an informed judgment can be made about the project's environmental consequences.

[1] The San Francisco Planning Commission certified the Peninsula Watershed Management Plan – Environmental Impact Report (File No.: 96.22E; State Clearinghouse No. 98082030) on January 11, 2001. While prepared as a Program EIR, the document examines one element of the Management Plan, the Fifield-Cahill Ridge Trail Project, at a project level. Other management plan elements were evaluated at a program level, including a proposed southern extension of the Bay Area Ridge Trail, denoted management action tra2 or Southern Skyline Boulevard Trail. The SFPUC approved the management plan pursuant to SFPUC Resolution 02-0265.

S.2 Project Summary

The project area includes watershed lands along the Fifield-Cahill ridge trail, which is approximately 1.5 miles north of the State Route 92 (S.R. 92)/State Route 35 (S.R. 35)[2] intersection, and watershed lands extending south from S.R. 92 approximately 6 miles to the Phleger Estate[3] boundary and east from S.R. 35 a few hundred feet. Primary project components proposed north of S.R. 92 include a new 0.5-mile universal access loop trail (including Americans with Disabilities Act-compliant access and parking), a 50-car parking lot, and one restroom along the existing Fifield-Cahill ridge trail, and the transfer of a public access easement (from the Bay Area Ridge Trail Council to SFPUC) along an existing trail segment of the Bay Area Ridge Trail through Skylawn Memorial Park. South of S.R. 92, project components include a new 20-car parking lot, two restrooms, and a new 6-mile southern skyline ridge trail. On the proposed southern skyline ridge trail, a prefabricated bridge would span a wetland in the vicinity of the trail alignment.

In response to public comments requesting the SFPUC consider multiple access options (see Chapter 1, Introduction), and to allow flexibility in crafting an access program that responds to ongoing watershed management requirements as well as environmental and economic considerations, the SFPUC is considering multiple public access program configurations with differing levels of restrictiveness. These access programs, each of which is analyzed in this EIR, would apply to existing and new trail areas north and south of S.R. 92, and cover the range of potential access controls – from supervised to unsupervised.

For the project, the SFPUC developed a proposed access program that would restrict access to the Fifield-Cahill ridge trail to visitors with a reservation and under the supervision of a trained volunteer (i.e., docent), similar to current access restrictions on this trail segment. Access to the southern skyline ridge trail would be unsupervised, but restricted to visitors who have obtained an access permit in advance.

The other access program variants considered in this EIR include access program variant 1 (docent program) supervised access, similar to the existing docent program; access program variant 2 (unsupervised/unrestricted access); and access program variant 3 (unsupervised/ restricted access). Proposed security measures (e.g., fencing and gates) would vary based on the access program. Chapter 2, Project Description, provides a detailed description of the project.

Should the Final EIR be certified, the SFPUC would consider project approval and selection of final access program configuration for trails north and south of S.R. 92 based on information obtained through the environmental analysis, additional cost and engineering feasibility considerations, and continued community engagement.

2 S.R. 35 is also Skyline Boulevard in this location.
3 The Phleger Estate is the property of the Golden Gate National Recreation Area.

S.3 Summary of Impacts and Mitigation Measures

This EIR analyzes the potential environmental effects of the project, as identified in the Notice of Preparation (NOP) of an EIR, issued December 21, 2016 to responsible agencies and interested parties, and issued March 30, 2017 to owners and occupants of properties within 300 feet of project components (Appendix A of this EIR). The NOP discloses that the EIR will provide a focused, yet detailed, tiered analysis of environmental topics for which a potentially significant impact could result, including the areas of Tribal and Other Cultural Resources, Natural Resources, Hydrology and Water Quality, Fire Management, Transportation and Access, and Noise. This EIR also provides analysis of impacts related to Aesthetics, Air Quality, Greenhouse Gas Emissions, Geology and Soils, and Hazards and Hazardous Materials. For the reasons presented in Section 4.12, Topics Not Requiring Detailed Environmental Analysis, impacts in the following areas would be less than significant, or have no impact: Agricultural and Forest Resources, Mineral and Energy Resources, Population and Housing, Land Use, Recreation, Utilities and Service Systems, and Wind and Shadow. As presented in Chapter 5, Other CEQA Issues, the project would have no impacts related to Growth Inducement. Accordingly, these topics are not addressed elsewhere in this EIR.

This summary provides an overview of the analysis contained in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. Impacts are categorized by type of impact as follows:

- **No Impact.** No adverse changes (or impacts) to the environment are expected.
- **Less than Significant.** An impact that would not involve an adverse physical change to the environment, does not exceed the defined significance criteria, or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations.
- **Less than Significant with Mitigation.** An impact that is reduced to a less-than-significant level though implementation of the identified mitigation measure.
- **Significant and Unavoidable with Mitigation.** An adverse physical environmental impact that exceeds the defined significance criteria and can be reduced through compliance with existing local, state, and federal laws and regulations and/or implementation of all feasible mitigation measures, but cannot be reduced to a less-than-significant level.
- **Significant and Unavoidable.** An adverse physical environmental impact that exceeds the defined significance criteria and cannot be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations and for which there are no feasible mitigation measures.

Table S-1 (beginning on p. S-9) and Table S-2 (beginning on p. S-43) present the impacts and mitigation measures that are identified in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures of this EIR. Table S-1 presents the impacts and mitigation measures that this EIR identifies for the proposed access program. Table S-2 presents the impacts and mitigation measures that this EIR identifies for the access program variants 1, 2, and 3. The tables are organized to correspond with environmental topics discussed in Chapter 4, Environmental

Setting, Impacts, and Mitigation Measures. Each table presents (1) impact description, (2) level of significance prior to mitigation measures (if applicable), (3) mitigation measures (if applicable), and (4) level of significance after mitigation (if applicable). For a complete description of potential impacts and recommended mitigation measures, refer to the topical sections in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures.

This EIR determined that the project would result in significant and unavoidable impacts, depending upon the chosen access program, in the areas of biological resources and transportation and circulation, that would remain significant and unavoidable even with implementation of feasible mitigation measures, as follows:

Biological Resources

- Project operations with unsupervised visitor access along Fifield-Cahill ridge trail would increase the potential for visitors, particularly bicycles and equestrians, to encounter and harm the San Francisco garter snake and California red-legged frog, particularly in the area of Five Points. (Impact BI-5; access program variants 2 and 3)

- Project operations with unsupervised visitor access along Fifield-Cahill ridge trail would increase the potential for direct impacts (e.g., trampling and crushing) on Mission blue butterfly or San Bruno elfin butterfly host plants, which could result in take of listed butterflies, including destruction of larvae and the permanent loss of occupied habitat. (Impact BI-5; access program variants 2 and 3)

- Project operations with unsupervised access could result in substantial adverse impacts related to accelerated spread of *Phytophthora* pathogens (including sudden oak death). (Impact BI-7; proposed access program [southern skyline ridge trail] and variants 2 and 3)

Transportation and Circulation

- Project operations with unsupervised visitor access would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92 where no marked or signalized crossing exists. (Impact TR-5; proposed access program and variants 2 and 3)

The EIR identified significant impacts that could be mitigated to a less-than-significant level with implementation of identified mitigation measures in the following areas:

- Cultural Resources (Project construction and operations effects on archeological resources, human remains, and tribal cultural resources; proposed access program and all variants)

- Noise and Vibration (Substantial temporary increase in ambient noise levels at the closest receptors from use of certain types of construction equipment; proposed access program and all variants)

- Air Quality (Project construction-related criteria pollutant and fugitive dust emissions could violate air quality standards and contribute substantially to an existing air quality violation, conflict with or obstruct implementation of the 2017 Clean Air Plan, or result in a considerable contribution to cumulative impacts; proposed access program and all variants)

- Biological Resources (Project construction effects on special-status plants, wildlife, and sensitive natural communities, and spread of invasive plant species; proposed access program and all variants)

- Biological Resources (Project operations effects on nesting birds and spread of invasive plant species; proposed access program and all variants. Project operations effects related to spread of plant pathogens; proposed access program [Fifield-Cahill ridge trail] and variant 1. Project operations effects on San Francisco garter snake and California red-legged frog along southern skyline ridge trail; proposed access program and variants 2 and 3. Project operations effects on special-status plants, marbled murrelet, and wildlife movement along Fifield-Cahill ridge trail; variants 2 and 3)

- Hazards and Hazardous Materials (Project construction risk of wildland fires; proposed access program and variants. Project operations with unsupervised access risk of wildland fires; proposed access program [southern skyline ridge trail] and variants 2 and 3)

- Tribal Cultural Resources (Project construction and operations effects on tribal cultural resources; proposed access program and all variants)

S.4 Summary of Alternatives

The following alternatives to the project are considered in this EIR and detailed further in Chapter 6, Alternatives:

- **Alternative A, No Project Alternative** represents what would reasonably be expected to occur in the foreseeable future if the project is not approved. The SFPUC would not construct the Southern Skyline Boulevard Ridge Trail Extension Project, and the project area would remain generally in its existing condition. There would be no changes in the existing docent program for the Fifield-Cahill ridge trail, the SFPUC would not implement the Fifield-Cahill ridge trail improvements, and the SFPUC would not construct the southern skyline ridge trail. The SFPUC would continue to operate and maintain the Fifield-Cahill ridge trail and associated existing facilities as under current conditions and watershed management procedures. Visitation under the No Project Alternative would be similar to existing visitation levels.

- **Alternative B, Relocated Parking Lot and Trailhead South of S.R. 92** would avoid the significant-and-unavoidable-with-mitigation impact related to traffic hazards. This alternative would relocate the parking lot and trailhead for the southern skyline ridge trail from the proposed location at the intersection of S.R. 92/S.R. 35 to a new location approximately 1.5 miles south of S.R. 92, near the site of a proposed permanent access drive and temporary construction staging. No trail would be constructed between S.R. 92 and the relocated parking lot and trailhead. This reduced trail alignment would accommodate multi-modal access and include docent-led, unsupervised/unrestricted, or unsupervised/restricted access. The 1.5-mile gap between S.R. 92 and the relocated trailhead of the southern skyline ridge trail would substantially reduce the likelihood that visitors of one trail segment would attempt crossing S.R. 92 to reach the opposite segment.

- **Alternative C, Pedestrian-Only Trail Access** would avoid the significant-and-unavoidable-with-mitigation impact related to San Francisco garter snake and California red-legged frog. This alternative would limit the mode of visitor access on Fifield-Cahill ridge trail and

southern skyline ridge trail to pedestrians only (thus eliminating bicycle and equestrian usage), while constructing all of the same trail and facility components as the project (except for the accommodation of equestrian parking in the parking areas). The pedestrian-only alternative would accommodate docent-led, unsupervised/unrestricted, or unsupervised/ restricted access. As a pedestrian-only alternative, alternative C would reduce impacts to special-status amphibians and reptiles on Fifield-Cahill ridge trail by limiting the mode of visitor access to foot travel on project trails, as compared to bicycle and equestrian travel that would be allowed under the project. Alternative C would be protective of special-status amphibians and reptiles because pedestrians would generally be closer to the ground and travel at slower speeds than would bicyclists and equestrians. For these reasons, pedestrians would be better able to detect and avoid special-status amphibians and reptiles that may be traveling or basking on the trail. Similarly, slower travel speeds would provide special-status amphibians and reptiles with more time to move out of harm's way.

- **Alternative D, Alternative Trail Alignment** would substantially reduce the significant-and-unavoidable-with-mitigation impacts related to special-status butterflies and their host plants, and accelerated spread of plant pathogens. There would be an alternative trail alignment providing improved trail access between Sweeney Ridge and the Phleger Estate via the existing Crystal Springs Regional Trail and Huddart County Park trail system. Alternative D would require the development of two trail connectors to supplement the existing trail system: a 1.2-mile connector trail (converted from existing SFPUC maintenance roads) between Sweeney Ridge and the Crystal Springs Regional Trail, and 1.3 miles of new trail in the vicinity of S.R. 92 between the Crystal Springs Regional Trail's San Andreas segment and Sawyer Camp segment. Alternative D would allow multi-modal (pedestrian, bicyclist, and equestrian) access on the connector trail between Sweeney Ridge and the Crystal Springs Regional Trail, and along the trail between the Sawyer Camp segment and Crystal Springs segment. The existing access modes for the Crystal Springs Regional Trail and the Huddart County Park trail system would not change. Visitor access along the 1.2-mile connector trail would be the same as described for the project (e.g., could range from docent-led access to unsupervised/unrestricted access). Visitor access along the 1.3 miles of new trail would be consistent with that of the adjacent existing Crystal Springs Regional Trail segments (i.e., unsupervised/unrestricted access). By largely using existing trails and paved access roads, alternative D would substantially reduce the significant-and-unavoidable-with-mitigation impacts on special-status butterflies and the potential for accelerated spread of *Phytophthora* pathogens identified for the project. However, this alternative could also result in similar or greater substantial adverse effects on San Francisco garter snake and California red-legged frog, as well as special-status plant species that may not occur within the project area.

Table S-3 provides a comparison of the significant environmental impacts identified for the project and the project alternatives (beginning on p. S-56).

S.5 Environmentally Superior Alternative

Pursuant to CEQA Guidelines section 15126(e)(2), an EIR is required to identify the environmentally superior alternative from among the alternatives evaluated if the project has significant impacts that cannot be mitigated to a less-than-significant level. The environmentally superior alternative is the alternative that best avoids or lessens any significant effects of the project, even if the alternative would impede, to some degree, the attainment of the project objectives.

Alternative B is the environmentally superior alternative among the project alternatives (other than the No Project Alternative). Alternative B would have the greatest impact reduction because it would avoid a significant traffic hazard impact, and would have a greater reduction in significant-but-mitigable impacts. Construction impacts would be reduced as compared to the project due to a 25 percent reduction in new trail construction, and operations impacts would be reduced compared to the project due to a 10 percent reduction in overall length of publicly accessible trail for the SFPUC to operate and maintain. Under Alternative B, significant impacts related to special-status amphibians, reptiles, and butterflies, as well as spread of plant pathogens, would remain. For construction and operation impacts, the main impact drivers would be the same as the project, the same types of impacts would remain significant, and Alternative B would require the same types of mitigations to reduce those impacts.

Alternative C would avoid a significant project impact by eliminating the potential for bicyclists and equestrians to harm San Francisco garter snake and California red-legged frog. Under Alternative C, significant impacts related to transportation hazards, special-status butterflies, as well as spread of plant pathogens, would remain. Construction impacts would be the same under Alternative C relative to the project because this alternative would involve construction of all the components described for the project. Alternative C would have slightly reduced operational impacts related to transportation and circulation, biological resources, and hazards and hazardous materials due to reduced overall visitation numbers under the pedestrian-only alternative. However, this intensity reduction would not decrease the relative severity of the operational impacts, as the key impact drivers would be substantially similar to those identified for the project, and require similar mitigations.

Alternative D would substantially reduce significant project impacts related to special-status butterflies and their host plants, and accelerated spread of plant pathogens. Alternative D construction would result in substantially reduced construction-related impacts on cultural and tribal cultural resources, noise, air quality and hazards due to a reduced construction footprint. However, new trail segments under Alternative D would pass through sensitive biological habitat and its construction could result in similar impacts on special-status plants, including impacts on endangered and threatened plant species not expected to occur in the project area. Alternative D would have similar or increased construction-related impacts as the project on special-status amphibians and reptiles, and on sensitive natural communities. In terms of operational impacts, significant impacts related to special-status plant species, special-status amphibians and reptiles, as well as transportation hazards would remain. Alternative D operations could result in new or greater significant impacts on special-status plants, and would have similar impacts as the project on special-status amphibians and reptiles, and on sensitive natural communities.

In summary, Alternative B is the environmentally superior alternative. Alternative B would have the greatest impact reduction because it would avoid a significant traffic hazard impact, and have a greater reduction in significant-but-mitigable impacts. Alternative B also meets most of the project objectives.

S.6 Areas of Controversy and Issues to be Resolved

Publication of the NOP and subsequently expanded outreach to owners and occupants of properties within 300 feet of the project initiated two 30-day public scoping periods—from December 21, 2016 to February 3, 2017, and from March 30, 2017 to April 29, 2017, respectively. The San Francisco Planning Department also held a public scoping meeting on January 18, 2017 at the SFPUC offices in San Francisco, California. During the scoping period, interested parties provided a total of 56 comments, including letters, emails, and oral comments. The comment letters, emails, and transcript of the comments received at the public scoping meeting are available for review at the San Francisco Planning Department as part of Case File No. 2016-016100ENV. The planning department has considered the comments made by the public in preparation of the project draft EIR. Comments on the NOP that relate to environmental issues are addressed and analyzed throughout this EIR and generally concern the following:

- Support for increased watershed access for recreational purposes, while continuing to protect water quality and other natural resources
- Effects of construction and operations on project area traffic and circulation
- Estimated number of trail users
- Effects of project implementation, including access program modifications, on scenic resources, noise, historical sites and cultural resources, wildlife and habitat, spread of invasive species and sudden oak death, and fire hazards
- Effects of unsupervised access on ability of users to safely cross S.R. 92 and S.R. 35

The planning department prepared a scoping report that summarizes the comments received on the project, including a transcript of oral testimony at the January 18, 2017 scoping meeting (see Appendix A). In addition, Chapter 1, Introduction, of this EIR provides further detail on the public comments received and provides a cross-reference to where each comment is addressed in this document.

TABLE S-1
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Aesthetics					
Impact AE-1: Project construction would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact AE-2: Project operation would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact C-AE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on aesthetic resources.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Cultural Resources					
Impact CU-1: Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.** The following mitigation measure is required to avoid any potential adverse effect from the project on accidentally discovered buried archeological resources as defined in CEQA Guidelines section 15064.5(a) and (c). The SFPUC shall distribute the San Francisco Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils disturbing	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Cultural Resources (cont.)					
Impact CU-1 (cont.)			activities within the project site. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the ALERT sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The SFPUC shall provide the Environmental Review Officer with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the review officer confirming that all field personnel have received copies of the ALERT sheet. Should any indication of an archeological resource be encountered during any soils disturbing activity of the project or during project operation, the project head foreman and/or SFPUC shall immediately notify the review officer and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the review officer has determined what additional measures should be undertaken. If the review officer determines that an archeological resource may be present within the project site, the SFPUC shall retain the services of an archeological consultant from the pool of qualified archeological consultants maintained by the planning department archeologist. The archeological consultant shall advise the review officer as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the review officer may require, if warranted, specific additional measures to be implemented by the project sponsor. Measures might include preservation in situ of the archeological resource; an archeological monitoring program; or an archeological testing program. If an archeological monitoring program or archeological testing program is required, it shall be consistent with the Environmental Planning division guidelines for such programs. The review officer may also require that the SFPUC immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions. The project archeological consultant shall prepare a final archeological resources report that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the report.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Cultural Resources (cont.)					
Impact CU-1 (cont.)			The project archeological consultant shall send copies of the draft archeological resources report to the review officer for review and approval. Once approved by the review officer, the project archeological consultant shall distribute copies of the final archeological resources report as follows: (1) California Archeological Site Survey Northwest Information Center shall receive one copy, with a copy of the transmittal of the archeological resources report to the Northwest Information Center sent to the review officer; (2) the Environmental Planning division of the planning department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD along with copies of any formal site recordation forms (California Department of Parks and Recreation 523 series) and/or documentation of nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public interest or interpretive value, the review officer may require a different final report content, format, and distribution than that presented above. The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable state and federal laws. This shall include immediate notification of the Coroner of the County of San Mateo and in the event of the coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission who shall appoint a Most Likely Descendant (Public Resources Code section 5097.98). The archeological consultant, SFPUC, Environmental Review Officer, and Most Likely Descendant shall have up to but not beyond six days after the discovery to make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines section 15064.5[d]). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. Nothing in existing state regulations or in this mitigation measure compels the SFPUC and the review officer to accept recommendations of a Most Likely Descendant. The archeological consultant shall retain possession of any Native American human remains and associated or unassociated burial objects until completion of any scientific analyses of the human remains or objects as specified in the treatment agreement if such as agreement has been made or, otherwise, as determined by the archeological consultant and the review officer.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Cultural Resources (cont.)					
Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries.	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.**	Less than Significant	Less than Significant
Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.**	Less than Significant	Less than Significant
Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries.	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains**	Less than Significant	Less than Significant
Impact C-CU-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on historical resources, archeological resources, or human remains.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Transportation and Circulation					
Impact TR-1: Construction of the project would not substantially conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of travel.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact TR-2: Project construction activities would not result in inadequate emergency access.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Transportation and Circulation (cont.)					
Impact TR-3: Project construction activities could result in potentially hazardous conditions for vehicles, bicyclists, and pedestrians.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact TR-4: Operation of the project would not cause a substantial adverse change in the significance of a transportation and circulation impact.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact TR-5: Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92.	Significant	Significant	**Mitigation Measure M-TR-5a – Installation of Signage.** The SFPUC shall install signs stating, "Do Not Cross" and "End of Fifield-Cahill Ridge Trail" or "End of Southern Skyline Ridge Trail" at the southern terminus of the existing Fifield-Cahill ridge trail and at the northern terminus of the proposed southern skyline ridge trail. The SFPUC shall also request that Caltrans install two-hour time limit signs in the vista point parking lot adjacent to the southern skyline ridge trailhead parking lot and "No Parking" signage along both sides of S.R. 35 at regular intervals from the S.R. 92/S.R. 35 intersection to the south approximately 500 feet. **Mitigation Measure M-TR-5b – Construction of a Pedestrian/Bicycle/Equestrian Bridge or Roundabout.** The SFPUC shall work with Caltrans to formulate and execute an agreement on the design, funding, and construction of either a grade-separated crossing or roundabout to reduce potentially hazardous conditions for trail user access across S.R. 92 near its intersections with S.R. 35 and Lifemark Road. The two options, as further described below based on preliminary evaluations conducted to-date, are conceptual, meaning that specific design elements may change. • *Bridge* – The grade-separated crossing shall consist of an elevated pedestrian, bicycle, and equestrian bridge over S.R. 92 at the east leg of the intersection with S.R. 35. The bridge will connect to a high point on the north side of S.R. 92, use a spiral ramp on the south side of S.R. 92, and provide a full grade-separated	Significant and Unavoidable	Significant and Unavoidable

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Transportation and Circulation (cont.)					
Impact TR-5 (cont.)			connection that does not require any modifications to the S.R. 92/S.R. 35 intersection. The bridge piers will be constructed within the Caltrans right-of-way, outside of the travel lanes. • *Roundabout* – The roundabout shall accommodate traffic flow among the S.R. 92 intersections with S.R. 35 and Lifemark Road (e.g., dual roundabout design). The SFPUC shall construct an at-grade crosswalk located at a safe point of pedestrian, cyclist, and equestrian passage at the roundabout (e.g., near the middle of the two roundabouts, where the distance between the opposing travel lanes is smallest). The roundabout shall be accompanied by signage installed adjacent to both the eastbound and westbound roadway approaches to the crosswalk to alert drivers of its presence. The crosswalk shall be marked with reflective, high-contrast pavement striping and pedestrian/cyclist/ equestrian trail crossing signs. The roundabout design shall be subject to Caltrans' review and approval, including for conformance with applicable state operations and safety design standards and best practices. The agreement shall also provide for the construction of new sidewalks connecting the selected crossing improvement (i.e., bridge or roundabout) to the existing adjacent Bay Area Ridge Trail segment along Lifemark Road to the north, and the southern skyline ridge trail trailhead and parking area approximately 300 feet to the south. Considering that transportation safety has long been and will continue to be a challenge at the subject intersections independent of the project, SFPUC's financial contribution in the agreement shall be roughly proportional to the project's impact. The selected crossing option (i.e., bridge or roundabout) shall be constructed prior to opening the Fifield-Cahill ridge trail to unsupervised public access (if southern skyline ridge trail is constructed) and prior to opening the southern skyline ridge trail to unsupervised public access.		
Impact C-TR-1: The project, in combination with past, present, and probable future projects, would not substantially affect transportation and circulation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Noise and Vibration					
Impact NO-1: Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	Less than Significant	Significant	**Mitigation Measure M-NO-1 – Construction Noise Reduction.** The SFPUC shall incorporate the following practices into the construction contract agreement documents, which the construction contractor shall implement: • Post signs onsite pertaining to permitted construction days and hours and complaint procedures and who to notify in the event of a problem, with telephone numbers listed; • At least two weeks prior to commencement of construction, provide notice of impending construction and construction schedule to sensitive receptors located within 500 feet of the northernmost 2 miles of the proposed southern skyline ridge trail, parking lot, and restroom construction, and the site of the Fifield-Cahill ridge trail parking lot; • Limit construction activity to the exempted hours (7 a.m. to 6 p.m. on weekdays; 9 a.m. to 5 p.m. on weekends) of the San Mateo County Code chapter 4.88; • To the extent that it does not extend the overall schedule, select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures); • Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors; • Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (measured at 200 feet) from immediately adjacent neighbors; • Ensure all construction equipment is in good working order and mufflers are inspected for proper functionality; • Prohibit unnecessary idling of equipment and engines; • To the extent that it does not extend the overall schedule, limit the simultaneous operation of multiple pieces of construction equipment close to noise-sensitive land uses; and • Use noise-reducing barriers or enclosures around stationary equipment when within 200 feet of receptors sufficient to achieve a 10-dBA reduction in noise levels.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Noise and Vibration (cont.)					
Impact NO-2: Construction activities would not result in excessive groundborne vibration.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact NO-3: Project operations would not result in a substantial permanent increase in ambient noise levels at the closest receptors or expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact C-NO-1: Construction of the project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels near the project area.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Air Quality					
Impact AQ-1: Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation.	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** *A. Engine Requirements.* • All excavators, bulldozers, and scrapers used in project construction shall have engines that meet the U.S. EPA or California Air Resources Board Tier 4 off-road emission standards. If engines that comply with Tier 4 off-road emission standards are not commercially available, then the project sponsor shall provide the next cleanest piece of off-road equipment as provided by the step-down schedules in Table M-AQ-1-1. The project sponsor shall submit documentation to the ERO of the following: 1) evidence that the Tier 4 equipment is not commercially available, identification of the compliance alternative in Table M-AQ-1-1 to be implemented, and analysis demonstrating that the compliance alternative would not exceed the significance threshold for NOx of an average of 54 lbs/day.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Air Quality (cont.)					
Impact AQ-1 (cont.)			*B. Waivers.* • The ERO may waive the equipment requirements of subsection (A) if: a particular piece of off-road equipment is technically not feasible; the equipment would not produce desired emissions reduction due to expected operating modes; installation of the equipment would create a safety hazard or impaired visibility for the operator; or, there is a compelling emergency need to use other off-road equipment. If the ERO grants the waiver, the contractor must use the next cleanest piece of off-road equipment with alternative fueling, according to table M-AQ-1-1, below. • The ERO may waive the equipment requirements of subsection A if: a particular piece of off-road equipment with an engine meeting Tier 4 emission standards is not regionally available to the satisfaction of the ERO. If seeking a waiver from this requirement, the project sponsor must demonstrate to the satisfaction of the ERO that the average daily emissions of NOx from project construction sources does not exceed a total of 54 pounds per day. • Use of renewable diesel is only required for equipment that does not meet the Tier 4 engine specification. With respect to renewable diesel, "commercially available" shall mean the availability taking into consideration factors such as: (a) critical path timing of construction; (b) geographic proximity of fuel source to the project site; and (c) cost of renewable diesel is within 10 percent of Ultra Low Sulfur Diesel #2 market price. • The project sponsor shall maintain records concerning its efforts to comply with this requirement. **TABLE M-AQ-1-1** **OFF-ROAD EQUIPMENT COMPLIANCE STEP-DOWN SCHEDULE** **Compliance Alternative** | **Engine Emission Standard** | **Emissions Control** 1 | Tier 3 | Use renewable diesel 2 | Tier 2 | Use renewable diesel **How to use the table:** If the Tier 4 emissions standards cannot be met for each piece of off-road equipment, then the project sponsors would need to meet Compliance Alternative 1. Should the project sponsors not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met. SOURCE: California Air Resources Board, 2016		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Air Quality (cont.)					
Impact AQ-1 (cont.)			**Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.** To limit dust, criteria pollutants, and precursor emissions associated with project construction, the following Bay Area air district-recommended Basic Construction Measures shall be included in all construction contract specifications for the project: • All exposed surfaces exclusive of trail areas (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day. • All haul trucks transporting soil, sand, or other loose material off site shall be covered. • All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. • All vehicle speeds on unpaved roads shall be limited to 15 miles per hour. • All paving shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used. • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure in title 13, section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points. • All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation. • Post a publicly visible sign at the project site entrance with the telephone number and person to contact at the SFPUC regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Bay Area Air Quality Management District's phone number shall also be visible to ensure compliance with applicable regulations.		
Impact AQ-2: Project construction activities would not create objectionable odors that affect a substantial number of people.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Air Quality (cont.)					
Impact AQ-3: Project construction activities would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact AQ-4: Emissions generated during project operation would not violate air quality standards and contribute substantially to an existing air quality violation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact AQ-5: Project operations would not create objectionable odors that affect a substantial number of people.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan.	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**	Less than Significant	Less than Significant
Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions.	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**	Less than Significant	Less than Significant
Greenhouse Gases					
Impact C-GG-1: Project construction and operation would not generate GHG emissions that could have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources					
Impact BI-1: Construction of the project could result in substantial adverse impacts on special-status plants.	Significant	Significant	**Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.** • Prior to initial ground-disturbing activities in the project area, a qualified botanist shall conduct a special-status plant survey in accordance with the California Department of Fish and Wildlife protocol. The survey shall cover all unsurveyed portions of the project area that might be affected by the project to identify special-status plants and sensitive natural communities. • Surveys shall be timed to ensure detection of all potentially occurring special-status plant species. If any special-status species are found within the project footprint, the plants shall be avoided by re-routing the project component to ensure that no work would affect the special-status plant species and by establishing a no-disturbance buffer around the species. The fence shall be located away from any identified special-status plant population. If special-status plant populations are found along the Fifield and Cahill service roads, the SFPUC shall install signage and protective fencing (such as split rail) to protect the population during construction. • If avoidance of special-status plants is not feasible, other options as recommended by a qualified botanist, including transplanting or reseeding in suitable habitat, shall be implemented according to the revegetation plan (M-BI-1c). **Mitigation Measure M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat.** Construction contractor(s) shall limit the construction disturbance area to that necessary for project construction and avoid non-project areas by posting signage delineating the construction disturbance area with flags, stakes, or fencing. **Mitigation Measure M-BI-1c – Revegetation Plan.** A qualified ecologist shall prepare and implement a revegetation plan with detailed specifications for restoring all temporarily disturbed areas. The plan shall include or provide for the following: • Preconstruction surveys of representative areas to characterize vegetation composition, including species present, vegetation characterization (tree diameter, etc.), percent cover contributed by each plant species, and total cover by natives, non-natives, and target invasive plant species. Photo points shall also be used to document pre-project conditions. The surveys shall be performed by a qualified ecologist with experience in vegetation restoration.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-1 (cont.)			• Use of locally native, ecologically appropriate species for revegetation. Only native species known to occur on the Peninsula Watershed in the affected habitat types shall be used in the planting and seeding palettes. Local native seeds should be sourced from the watershed where possible. Upon approval of the SFPUC or approved representative, some seed may be sourced from suppliers who specialize in locally sourced seed from the greater Bay Area region. • Sanitation measures (e.g., locally sourced cuttings, the elimination of container stock, or the exclusive use of container plants that were grown according to plant pathogen best management practices) to prevent the introduction and/or spread of sudden oak death, other plant pathogens, and invasive plants during revegetation. • Performance criteria and measures to control/remove target invasive plants. Control species shall include those ranked by Cal-IPC as high or moderately invasive, except those that are already widespread in the watershed (e.g., non-native bromes, rough cat's ear [*Hypochaeris radicata*], Italian ryegrass [*Festuca perennis*], wild oats [*Avena fatua*], etc.). The revegetation plan shall distinguish between well-established invasives not targeted for management and invasives targeted for management. Target invasive plants include but are not be limited to the following: yellow star-thistle, purple star-thistle, Italian thistle, shortpod mustard, poison hemlock, and large periwinkle. Because the proposed trail may serve as a conduit for spread of weeds, controlling newly introduced invasive weeds promptly and effectively at disturbed construction sites is critical. The performance standard for target invasive weeds shall be no more than 10 percent absolute cover during the five-year performance period. • The minimum performance criteria shall include: – Combined native and naturalized[4] plant cover (50 percent cover; or equal to or greater than baseline within five years) (applies to non-maintained areas only) – Maximum cover by target invasive plant species (no more than 10 percent absolute cover during each year of the monitoring period) If special-status plants are identified within the active work area and cannot be avoided, the revegetation plan shall include salvage and transplantation measures to seed or relocate affected plants to an appropriate nearby revegetation site. The		

[4] Note that naturalized species may include Cal-IPC moderate species such as non-native bromes, Italian ryegrass, wild oats, and other species found in the Peninsula Watershed.

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-1 (cont.)			qualified ecologist shall identify those plants for which translocation would likely be successful and feasible, and for each of those species the plan shall include a description of microhabitat conditions necessary for the species, salvage and transplantation procedures, seed collection and germination methods, an assessment of potential transplant and enhancement sites, performance criteria (e.g., less than 10 percent coverage by target invasive plants and comparable plant abundance, as deemed appropriate for the affected species), and a long-term monitoring program. Special-status plant mitigation areas shall be established at a ratio of 1:1 (impacted area to plantings) based on either the impacted area or the number of impacted individuals, as deemed appropriate by the qualified ecologist. Plants that can be feasibly relocated shall be transplanted into the revegetation site, typically adjacent suitable habitat that is unoccupied, to avoid making transplants into undisturbed occupied habitat and potentially spreading diseases. If salvage and transplantation is not feasible, consistent with the requirements of the Native Plant Protection Act, the SFPUC shall notify the California Department of Fish and Wildlife at least 10 days prior to disturbance to allow for the salvage of rare or endangered native plants that would otherwise be destroyed. **Mitigation Measure M-BI-1d – Worker Environmental Training.** A qualified biologist shall conduct a biological resources awareness training session for all construction personnel. A qualified biologist is an individual with a four-year degree in biological sciences and familiarity with the special-status species and their habitat that may occur on the site. The training shall be provided for all personnel prior to individuals conducting any work on site, including vegetation clearing. At a minimum, the training shall include: • A description of rare plants and sensitive vegetation communities that may be encountered, and means of avoiding or minimizing impacts on these species and communities • A description of the San Francisco garter snake, California red-legged frog, marbled murrelet, and other special-status species that may be encountered, the importance of these species and their habitat, the measures being implemented to conserve these species, the boundaries within which the project construction shall occur, and the penalties for failing to comply with biological mitigation requirements • A description of listed butterflies and how to avoid impacts on these species and their host plants		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-1 (cont.)			• Instruction that personnel shall not feed or otherwise attract any wildlife or bring pets into the project area, adherence to speed limits and proper trash removal, and other best management practices • Orientation regarding the importance of preventing the spread of invasive weeds and plant pathogens, and means of avoiding such spread		
Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife.	Significant	Significant	**Mitigation Measure M-BI-1c – Revegetation Plan.** **Mitigation Measure M-BI-1d – Worker Environmental Training.** **Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.** The following measures shall be implemented before and during construction: • Construction contractor(s) shall limit the construction disturbance area to that necessary for project construction and avoid outside areas by posting signage delineating the construction disturbance area with flags, stakes, or fencing. • The SFPUC shall identify a qualified biologist (who has familiarity and field experience with the affected species, as described in M-BI-1d) to act as construction monitor before construction work begins. • No more than two weeks prior to the onset of work activities and immediately prior to commencing work, the qualified biologist shall conduct a thorough survey of the entire construction footprint for San Francisco garter snake, California red-legged frog, and other special-status species with the potential to be present. • The SFPUC shall ensure that, during work activities, all trash is properly contained in closed containers, removed from the work site and disposed of daily to avoid attracting predators to the site. • The contractor and all site personnel in motorized vehicles shall maintain a speed limit of 15 miles per hour within the project area at all times. • The construction contractor shall install a wildlife exclusion fence in or adjacent to wetland areas where earthmoving equipment will be used. The qualified biologist shall determine specific locations for the exclusion fencing and shall be present during, and oversee vegetation removal for, construction of the exclusion fence.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-2 (cont.)			• The contractor shall install an exclusion fence containing exit funnels to allow any San Francisco garter snakes within the construction area to leave without human intervention while preventing entry of San Francisco garter snake and California red-legged frog into the construction zone. Exit funnels shall be placed no more than 200 feet apart along the fence, or as modified by the biological monitor. The exit funnels shall be installed at ground level. • At the beginning of each workday that includes initial ground disturbance, including grading, excavation, and vegetation-removal activities, the approved biologist shall conduct onsite monitoring for the presence of these species in the area where ground disturbance or vegetation removal will occur. The biologist shall inspect the perimeter fences to ensure they do not have any tears or holes, that the bottoms of the fences are still buried, and that no individuals have been trapped in the fences. • Construction work crews shall cover all excavated or deep-walled holes or trenches greater than 2 feet at the end of each workday using plywood, steel plates, or similar materials or shall construct escape ramps of earth fill or wooden planks to allow animals to exit. Before such holes are filled, workers shall thoroughly inspect them for trapped animals. • If a special-status species is present within the exclusion fence area during construction, work shall cease in the vicinity of the animal, and the animal shall be allowed to relocate of its own volition unless otherwise approved by the regulatory agencies with jurisdiction over the species. • The contractor shall maintain the temporary fencing—both exclusion fencing and protective fencing (if installed)—until all construction activities are completed. No construction activities, parking, or staging shall occur beyond the fenced exclusion areas. After construction is completed, the contractor shall remove exclusion fencing, cover boards, and all associated debris and either store or dispose of it off site. • Project personnel shall be required to immediately report any harm, injury, or mortality of a special-status species during construction (including entrapment) to the biological monitor, who shall immediately notify the SFPUC. As appropriate, the SFPUC shall provide verbal notification to the U.S. Fish and Wildlife Service's Endangered Species Office in Sacramento, California and/or to the California Department of Fish and Wildlife warden or biologist (as applicable) and written notification, as requested, by the agencies.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-2 (cont.)			• Once all initial ground-disturbing activities are completed, the biological monitor shall perform spot checks of the project area at least once a week, and daily between November and April during rain events, for the duration of construction to ensure that the perimeter fence is in good order, trenches are being covered if left open overnight (or escape ramps provided), project personnel are conducting checks beneath parked vehicles prior to their movement, and all other required biological protection measures are being followed. **Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.** • Prior to any trail-related construction, vegetation management, development, or any other ground-disturbing activities, a qualified biologist (i.e., with demonstrated experience working with these species) shall conduct preconstruction surveys for butterfly larval host plants (*Sedum spathulifolium, Lupinus albifrons, L. formosus,* and *L. variicolor*). The qualified biologist shall survey any areas within 1.5 miles of Portola Gate where vegetation disturbance for fencing installation would occur. • Prior to construction, the qualified biologist shall flag all areas containing host plants so that personnel avoid vehicular and foot traffic in these areas. **Mitigation Measure M-BI-2c – Avoidance and Minimization Measures for Dusky-footed Woodrat and American Badger.** The following measures shall be implemented to avoid and minimize impacts on dusky-footed woodrat and American badger, if present: • A qualified biologist with experience identifying woodrat nests and badger dens shall conduct a preconstruction survey for San Francisco dusky-footed woodrat nests and American badger dens in suitable habitat along: the universal access loop trail, staging area, parking lots; the southern skyline ridge trail work area, parking lot, and staging areas; and all fencing work areas along the southern skyline ridge trail and Fifield-Cahill ridge trail, including along the Skyline Quarry access road. The qualified biologist shall flag active nests/dens identified within the project work areas as a sensitive resource to be avoided during construction. • Should avoidance of active woodrat stick nests within the project site not be feasible, the nests shall be dismantled by hand under the supervision of the qualified biologist, consistent with California Department of Fish and Wildlife		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-2 (cont.)			guidance and permits, as applicable. If young are encountered during dismantling of the nest, material shall be replaced and a 20-foot no-disturbance buffer shall be established around the active nest. The biologist shall inspect the nest at least 24 hours later to see if the young are present. If the young are still present, the buffer shall remain in place until the woodrats have matured enough to disperse on their own accord and the nest is no longer active. **Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.** The SFPUC shall conduct tree and shrub removal in the project area outside the breeding season (generally August 16 through February 14) for migratory birds and raptors whenever possible. In the event that the construction schedule requires work during the breeding season, tree and shrub removal shall occur only in the absence of nesting birds. If the SFPUC conducts construction activities during the avian breeding season (February 15 to August 15), a qualified biologist experienced in identifying birds and their habitat shall conduct nesting-raptor surveys within 500 feet of construction areas (as access is allowed on adjacent private lands). The biologist shall conduct nesting songbird surveys within 150 feet of all work areas (as access is allowed on adjacent private lands) and shall map all migratory bird and active raptor nests within these areas. These surveys shall be conducted within two weeks prior to the initiation of construction activities at any time between February 15 and August 15. If no active nests are detected during surveys, no additional mitigation is required. If migratory bird and/or active raptor nests are found within the construction area or in the adjacent surveyed area, the SFPUC shall establish a no-disturbance buffer around the nesting location to avoid disturbance or destruction of the nest site until after the breeding season or after the biologist determines that the young have fledged (usually late June through mid-July). The biologist shall determine the extent of these buffers consistent with U.S. Fish and Wildlife Service guidelines, and buffer placement would depend on: the species' sensitivity to disturbance, which can vary among species; the level of noise or construction disturbance; the line-of-sight between the nest and the disturbance; ambient noise (baseline noise) and other disturbances under existing conditions; and consideration of other topographical or artificial barriers.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-2 (cont.)			**Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.** A qualified biologist experienced in the identification of special-status bats shall conduct a preconstruction survey for special-status bat species habitat in advance of any tree removal to identify signs of potential bat habitat, including maternity colonies and any active roost sites. Identified bat maternity colonies shall be avoided, if possible. Should potential maternity colonies, roosting habitat, or active bat roosts be found in trees but cannot be avoided, SFPUC shall ensure the following measures are implemented: • Trim trees or install bat exclusion devices when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of the bat maternity roosting season (approximately April 15 to August 15) if a maternity roost is present, and outside the months of winter torpor (approximately October 15 to February 28, or as determined by a qualified biologist experienced in the identification of special-status bats), to the extent feasible. • If tree trimming is not feasible during the periods when bats are active, and bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the tree trimming, a qualified biologist shall delineate a no-disturbance buffer around these roost sites until they are no longer in use as maternity or hibernation roosts or the young are capable of flight. • Based on the professional opinion of a qualified biologist, buffer distances may be adjusted around roosts depending on the level of surrounding ambient activity (e.g., if the project area is adjacent to a road or active quarry area) or if an obstruction, such as a large rock formation, is within the line-of-sight between the nest and construction. • A biologist experienced in the identification of special-status bats shall be present during tree trimming and disturbance to rock crevices or outcrops if bat roosts are present. Project activities shall disturb trees and rock crevices with roosts only when no rain is occurring or is not forecast to occur for three days and when daytime temperatures are at least 50 degrees Fahrenheit. • Under the supervision of the qualified biologist, trim trees containing or suspected to contain roost sites over two days. On the first day, branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws. The following day, branches or limbs containing roost sites shall be trimmed with chainsaws, under the supervision of the biologist.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands.	Less than Significant	Significant	**Mitigation Measure M-BI-3 – Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities.** • Prior to start of construction, the extent of sensitive natural communities within the work area shall be surveyed by a qualified botanist experienced in the definition and recognition of the sensitive natural communities in this region, as a basis for avoiding and minimizing impacts on sensitive natural communities. The outer dripline of the tree canopy in Douglas fir forest, redwood forest, and tanoak forest shall be defined as the limits of the natural community; areas currently managed as fuelbreaks shall not be considered part of the extent of sensitive natural communities. SFPUC shall carry out an as-built survey after the project is completed to document the extent of permanent and temporary impacts on sensitive natural communities. • Within Douglas fir forest, redwood forest, and tanoak forest, SFPUC native trees whose dripline extends within the work area shall be protected using best practices to minimize impact on roots and for cutting roots, when necessary, to minimize the potential to weaken trees and spread disease. SFPUC shall ensure the following actions are implemented during construction within sensitive natural communities to protect native trees: – A certified arborist or qualified ecologist shall assist in tree protection planning, monitoring, and follow-up maintenance as needed to protect trees. – Barriers or sturdy fencing shall be used around individual trees or groups of trees that require protection to define and protect critical root zones near work areas. – Excavation and ground disturbance shall be minimized within the critical root zone (i.e., within the tree dripline). – Construction shall avoid cutting tree roots over 4 inches in diameter, and any necessary cuts shall be made cleanly with sharp tools to encourage wound closure and confine the spread of decay. – To avoid compacting soils during construction in sensitive natural communities, no parking of cars, trucks, or heavy equipment shall occur within the critical root zone. • The SFPUC shall compensate for temporary and permanent impacts on sensitive needlegrass grassland and serpentine bunchgrass natural communities by revegetation, wherever feasible, as part of Mitigation Measure M-BI-1c.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact BI-5: Project operations could result in substantial adverse impacts on special-status wildlife.	Significant	Significant	**Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.** **Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-status Bats and Maternity Roosts.** **Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.** • The SFPUC shall limit public use of the trail system to 9 a.m. to 4 p.m. in winter, and 8 a.m. to 6 p.m. in summer, to avoid periods when wildlife are most active and minimize human-wildlife conflicts. • The SFPUC shall provide interpretive signage to educate the public concerning potential recreational impacts on special-status and native wildlife. Topics shall include the protection of listed butterflies, marbled murrelet, San Francisco garter snake, and California red-legged frog, the importance of properly disposing food trash, and the need to avoid butterfly host plants. The SFPUC shall educate the public on the dangers of trampling, intentional or unintentional feeding of park wildlife, and harassment through observation or pursuit. • Each spring, the SFPUC shall demarcate the locations of butterfly host plants. Along the trail edge in the vicinity of these plants, Carsonite brand fiberglass composite or equivalent markers shall be installed to indicate the habitat that visitors and maintenance traffic should avoid. The SFPUC shall monitor and maintain these markers throughout the year to protect all phases of the butterfly life cycle. • During operations, the SFPUC shall regularly monitor and hand-clear non-native invasive plants and all shrubs from grassland habitat along the Fifield-Cahill ridge trail that supports butterfly larval host plants (i.e., select areas from Portola Gate to approximately 1.5 miles farther south) to limit the encroachment of native and non-native invasive species on butterfly host plants. The SFPUC shall treat any trampling that causes the loss of host plants as the take of a listed butterfly and shall provide mitigation as described below in Mitigation Measure M-BI-5b, via habitat enhancement or contribution to habitat restoration in areas that support San Bruno elfin butterfly and/or Mission blue butterfly, such as at San Bruno Mountain.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-5 (cont.)			• The SFPUC shall continue to conduct annual breeding-season monitoring for: – Murrelets, as described in Avocet Research Associates:[5] ▪ Conduct nesting season flyover surveys over multiple sequential days in the Pilarcitos Watershed to estimate the number of breeding murrelets. – Listed butterflies, as described in Arnold, Richard A., Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed, prepared for San Francisco Public Utilities Commission, December 2016, as follows: ▪ Conduct surveys to visually monitor the life stages of both endangered butterflies at all of the same Ridge Trail study sites studied since 2004. ▪ Regularly inspect all the foodplant locations that are part of the Ridge Trail study sites for signs of trampling or other damage, and take measurements of the area of foodplant at each location. ▪ Conduct presence-absence butterfly and foodplant surveys along other service roads and off-road locations throughout the entire watershed that were identified by the Geographic Information System-based models created to predict the potential occurrences of the lupine or stonecrop larval foodplants. **Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.** • The SFPUC shall post informational signage at trailheads explaining the presence of endangered species and/or their habitat and the importance of preserving host plants as habitat for endangered butterflies. The signs shall provide speed limits to slow bicyclists and shall explain the need to avoid closed areas and roped-off plants and to use care in traversing sensitive habitat areas. • If population decline is recorded during annual surveys and the surveyors determine trail usage or unauthorized off-trail use appears to be a contributing factor, the SFPUC shall monitor the population and implement protective measures in order to reduce the impacts of trail usage. Protective measures may include additional fencing, signage, increased enforcement, rerouting the road or trail, returning to docent-led access, or seasonal trail closure.		

[5] Avocet Research Associates, *Protocol-level Nesting Season Surveys for the Marbled Murrelet (Brachyramphus marmoratus)*, San Francisco Public Utilities Commission Lands, Upper Pilarcitos Creek, San Mateo County, California, 2018.

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-5 (cont.)			• To compensate for the loss of listed butterfly host plants due to trampling, the SFPUC shall clear existing host plant patches or nearby bare areas on the Peninsula Watershed of invasive competitor species and shrubs and reseed the areas to improve habitat and encourage butterfly use. Specifically, the SFPUC shall collect and scatter lupine seeds within the existing host plant patches or nearby bare areas at a 2:1 ratio to lost host plant acreage, or as otherwise required by the U.S. Fish and Wildlife Service. The SFPUC shall monitor sites in accordance with the success parameters provided by Mitigation Measure M-BI-1c. • Whether on or off the site, restoration sites shall be chosen based on several factors including: – Size of the mitigation area, with large contiguous areas of habitat preferred over small, separated areas – Demonstrated nearby species use or occupancy – Overall habitat suitability and quality – Proximity of the mitigation area to the lupine impact site – The presence of appropriate soils and environmental conditions to support target plant species – The absence of long-term impact mechanisms or threats to successful restoration • Alternatively, the SFPUC may fund butterfly habitat restoration in an equivalent area, based upon the 2:1 ratio of restoration to lost host plant acreage at the San Bruno Mountain Habitat Conservation Plan implementing agency, or other existing comparable restoration initiative or program permitted by the U.S. Fish and Wildlife Service for Mission blue butterfly. • The SFPUC shall continue annual monitoring (Arnold, 2016) and use the findings to assess the impacts of increased visitation on sensitive species, butterfly host plants, and vegetation communities and allow for adaptive management. If visitation shows a significant impact on vegetation, such as host plant trampling or reduction in plant numbers, the SFPUC shall consider additional actions such as supplementary educational signage; additional flagging; more frequent maintenance, security patrols, and increased enforcement; increased seasonal restrictions; or reversion to more restricted access (such as permit or docent only).		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-5 (cont.)			• In the Five Points area, the SFPUC shall install signage designating a speed limit of 10 miles per hour within 1,000 feet of the intersection, and may install road striping or similar mechanism on both sides of the intersection to induce bicyclists to slow speeds through this area. If warranted based on visitor conduct, the SFPUC shall place camera stations and enforcement personnel in this area to monitor for non-compliance, trespassing, and illegal collection.		
Impact BI-6: The project would not result in operational impacts on sensitive natural communities, including riparian habitat and wetlands.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens.	Significant	Significant	**Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.** • The SFPUC shall annually survey and monitor special-status plants within 20 feet of the Fifield-Cahill ridge trail, loop trail, and southern skyline ridge trail centerline to detect changes in population size, location, and vigor. If population decline is recorded during annual monitoring and the surveyors determine trail usage or unauthorized off-trail appears to be a contributing factor, the SFPUC shall protect the population and reduce the impact of trail usage by implementing measures such as additional fencing, signage, increased enforcement, rerouting the road or trail, translocation or reseeding, returning to docent-led access, or seasonal trail closure. The SFPUC shall monitor and enforce protection of special-status plant populations for 10 years or until monitoring demonstrates that trail use has no substantial effect on year-over-year plant vigor or plant population numbers, whichever is longer. • The SFPUC shall provide informational signage to educate the public concerning potential recreational impacts on native vegetation, including sudden oak death and other *Phytophthora* spp. • The SFPUC shall regularly inspect trail fencing (e.g., weekly or monthly) and promptly repair damage (e.g., quarterly) in order to maintain fencing integrity and prevent off-trail use. • All motorized vehicles shall maintain a speed limit of 15 miles per hour within the project area (10 miles per hour at Five Points) at all times to avoid harm to sensitive species.	Less than Significant	Significant and Unavoidable

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-7 (cont.)			• The SFPUC shall provide closed (wildlife-proof) garbage containers at trailhead parking areas for the disposal of trash items (e.g., wrappers, cans, bottles, food scraps) and empty them daily. The SFPUC shall scan the project area for litter during daily sweeps. **Mitigation Measure M-BI-7a – Measures to Reduce Spread of Invasive Plants.** The SFPUC shall ensure the following measures to reduce spread of invasive plants are implemented: • Construction equipment shall arrive at the project area free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species • Any imported fill material, soil amendments, gravel, etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface, shall be certified free of weed seeds and plant material. (see: www://cal-ipc.org/ip/prevention/WeedFreeLandManagers_web.pdf) • Certified, weed-free, imported erosion-control materials (or rice straw in upland areas) shall be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.). • Excavated topsoil shall be salvaged, stored on-site, and reused on the site if it is of suitable quality, or removed and disposed at an appropriate offsite location if it is not suitable. • Prepare and implement an invasive plant management plan for the Fifield-Cahill ridge trail and southern skyline ridge trail segments on Peninsula Watershed lands. At a minimum, the plan shall commit the SFPUC to carry out semiannual surveys and treatment and removal of target invasive plants on the southern skyline ridge trail and Fifield-Cahill ridge trail segments during the operation of the ridge trail. The plan shall specify invasive exotic plant species shall be managed using integrated pest management practices, and define invasive plants as those which the Cal-IPC rates as high in invasiveness, and a subset of those it rates as moderate in invasiveness and which pose relevant management concerns for the ridge trail region of the Peninsula Watershed (i.e., could spread along the trail). The plan shall except from this definition any species that are already widespread and naturalized in the watershed (e.g., annual and perennial non-native grasses, rough cat's ear, etc.). The performance standard for target invasive weeds shall be no more than 5 percent absolute cover, or		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-7 (cont.)			no more than 30 percent above-baseline invasive plant cover, whichever is higher, within 20 feet of the southern skyline ridge trail, Fifield-Cahill ridge trail, or Quarry Road edge. **Mitigation Measure M-BI-7b – Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death).** • The SFPUC shall post signage along the southern skyline ridge trail requiring users to remain on the surfaced trail rather than venturing onto adjacent soil to prevent the spread of soil-borne pathogens. • Based on the rate and extent of pathogen spread, the SFPUC may adopt further measures to reduce disease spread, such as the use of phytosanitizing wash stations at entrances for vehicles and individuals entering the Peninsula Watershed per the recommendations of the *Phytophthora* Working Group's Guidelines to Minimize *Phytophthora* Contamination in Restoration Projects, October 2016 (see Appendix D). • Project staff and volunteers (e.g., docents) shall be trained to educate visitors about the need to avoid the spread of *Phytophthora* spp. and other pathogens, such as by not stepping in or riding through ponded water and mud and complying with phytosanitation measures, if implemented, before and after trail use. **Mitigation Measure M-BI-7c – Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens.** • SFPUC maintenance staff shall monitor the condition of the trail edges on the southern skyline ridge trail. If monitoring identifies areas of exposed earth or mud adjacent to the trail where vegetation has been removed due to foot traffic beyond the 6-foot-wide aggregate base trail, additional gravel or other measures to prevent direct soil contact (e.g., signage, barriers) shall be placed in these locations to reduce the potential for spread of *Phytophthora* spp. pathogens. • At least once, beginning one year before construction is completed, the SFPUC shall retain a qualified forest pathologist who is familiar with signs of *Phytophthora* damage to conduct a review of plant health along all portions of the southern skyline ridge trail, the Fifield-Cahill ridge trail, and Quarry Road. The forest pathologist shall test unhealthy trees and shrubs adjacent to the alignment for the presence of *Phytophthora* spp. pathogens This review shall be used to determine the baseline extent of the infestation and assess the rate of spread over the baseline rate.		

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Biological Resources (cont.)					
Impact BI-7 (cont.)			The forest pathologist shall establish permanent monitoring transects away from trails to examine the baseline tree infestation over time (i.e., the control area) to compare with transects in forested areas located adjacent to the trail segment with unsupervised access (i.e., southern skyline ridge trail and/or Fifield-Cahill ridge trail). The forest pathologist shall monitor *Phytophthora* infection conditions in each area for a period of at least five years. Monitoring data shall be evaluated using a statistical test, such as a t-test, to assess the potential rate of spread over the baseline rate. The SFPUC shall use this information to gauge the need to deploy measures to reduce spread, as presented in Measure M-BI-7b.		
Impact BI-8: Construction of the project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact C-BI-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on biological resources.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Geology, Soils, and Paleontology					
Impact GE-1: Project construction would not result in substantial erosion or loss of topsoil during construction.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact GE-2: The project is located on a geologic unit that is potentially unstable, but would not increase the potential for landsliding, collapse, or other slope failures during construction.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Geology, Soils, and Paleontology (cont.)					
Impact GE-3: Construction of the project would not substantially alter the topography of the proposed trail alignment.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact GE-4: The project would not directly or indirectly destroy a unique paleontological resource during construction.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact GE-5: The project would not expose people or structures to the risk of loss, injury, or death involving seismic groundshaking, seismically induced landslides, or potentially unstable geologic units during operation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact GE-6: Runoff from the permanent project components would not result in substantial erosion or loss of topsoil during operation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact GE-7: Use of the trails under the proposed access program and variants would not result in substantial erosion or loss of topsoil during operation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact C-GE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on geology, soils, or paleontological resources.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Hydrology and Water Quality					
Impact HY-1: Construction of the project would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, or alter existing drainage patterns.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HY-2: Stormwater runoff from permanent project components would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HY-3: Use of the trails under the proposed access program and variants would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Hydrology and Water Quality (cont.)					
Impact C-HY-1: The project, in combination with past, present, and probable future projects in the site vicinity, would not result in significant adverse cumulative hydrology impacts.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Hazards and Hazardous Materials					
Impact HZ-1: Project construction would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HZ-2: Project construction 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 present in the soil.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HZ-3: Project construction would not result in a significant hazard to the public or the environment through reasonably foreseeable conditions involving the release of naturally occurring asbestos.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HZ-4: Project construction would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Hazards and Hazardous Materials (cont.)					
Impact HZ-5: Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	Significant	Significant	**Mitigation Measure M-HZ-5 – Fire Safety During Construction.** The SFPUC shall require the construction contractor to comply with the following requirements of the Public Resources Code during construction: • Earthmoving and portable equipment with internal combustion engines shall be equipped with a spark arrester to reduce the potential for igniting a wildfire (Public Resources Code section 4442). • Appropriate fire suppression equipment shall be maintained during the highest fire danger period—from April 1 to December 1 (Public Resources Code section 4428). • On days when a burning permit is required, flammable materials shall be moved to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor shall maintain the appropriate fire suppression equipment (Public Resources Code section 4427).[6] • On days when a burning permit is required, the appropriate fire suppression equipment shall be maintained when portable tools powered by gasoline-fueled internal combustion engines are used within 25 feet of any flammable materials (Public Resources Code section 4431).	Less than Significant	Less than Significant
Impact HZ-6: The project 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 present in the soil during operation.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Impact HZ-7: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant

[6] The project would not require a burning permit, but these restrictions would apply when burning permits would be required for projects that do involve burning. This time period would be from May 1 to a date specified by CalFire when the department has determined that hazardous fire conditions have abated for that year. CalFire may also declare that unusual fire hazard conditions exist in the area at any time during the year and impose these requirements.

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Hazards and Hazardous Materials (cont.)					
Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	Less than Significant	Significant	**Mitigation Measure M-HZ-8: Fire Management Plan.** The SFPUC shall prepare and implement a new fire management plan in coordination with CalFire prior to opening the southern skyline ridge trail, universal access loop trail, or Fifield-Cahill ridge trail to unsupervised public access. The new fire management plan shall include the actions of the fire management element of the Peninsula Watershed Management Plan relevant to the project and which have not been completed. Specifically, the new fire management plan shall include: • Relevant fire defense improvement actions related to increasing the water supply for firefighting and constructing access improvements (Peninsula Watershed Management Plan fire defense improvement actions fir2, fir3, fir4, fir5, fir6, and fir7 – see expanded mitigation measure in Appendix E). • Relevant fuel management actions related to reducing fuel volume and flammability, establishing/maintaining fuel discontinuity, and preventing fires from spreading to the tree crowns (Peninsula Watershed Management Plan fuel management action fir8 – see expanded mitigation measure in Appendix E). Relevant fire response actions that provide the framework for the SFPUC's response to fires (Peninsula Watershed Management Plan fire response actions fir9, fir10, fir11, fir12, and fir13 – see expanded mitigation measure in Appendix E). If prescribed burns are proposed for fuel management, the fire management plan shall specify appropriate actions for safe implementation. These actions include preparing a prescription (or burn plan), coordinating with appropriate regulatory agencies regarding potential environmental impacts, obtaining a burn permit from the Bay Area Air Quality Management District, and notifying the public and neighboring agencies. The prescribed burn shall be conducted when conditions permit both adequate combustion and control of the fire and shall be coordinated with CalFire as part of its vegetation management program. The new fire management plan shall address all of the identified fire management element actions and tailor those actions to site-specific conditions, as well as the potential effects of climate change. The plan's implementation methodology shall consider and incorporate, as relevant, the methods set forth in the Peninsula Watershed Management Plan's Appendix A-1 (Peninsula Watershed Fire Management Element). An implementation schedule shall be provided. The southern skyline ridge trail, universal access loop trail, and Fifield-Cahill ridge trail shall not be opened for unsupervised access	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Hazards and Hazardous Materials (cont.)					
Impact HZ-8 (cont.)			until the actions intended to address fire risk in those areas have been completed. The SFPUC shall coordinate preparation and implementation of the fire management plan with CalFire as part of its fire prevention and vegetation management programs, in accordance with standing procedures and Peninsula Watershed Management Plan policy F9. Implementation of the fire management plan shall be assigned to an incident commander employed by the SFPUC's Natural Resources and Land Management Division in accordance with Peninsula Watershed Management Plan action fir13.		
Impact C-HZ-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts related to hazards and hazardous materials.	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant
Tribal Cultural Resources					
Impact TCR-1: Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	Significant	Significant	**Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation Plan and/or Interpretive Program.** If the archeological consultant called for under M-CU-1 determines that the accidental discovery is an archeological resource of Native American origin, retains sufficient integrity, and is of potential scientific/historical/cultural significance, Mitigation Measure M-TCR-1 shall be implemented. In the event of the discovery of an archeological resource of Native American origin, the Environmental Review Officer (ERO), the project sponsor, and the tribal representative shall consult to determine whether preservation in place would be feasible. If it is determined that preservation-in-place of the tribal cultural resource would be both feasible and effective, then the archeological consultant shall prepare an archeological resource preservation plan to be implemented by the project sponsor during construction. If the ERO in consultation with the project sponsor and the tribal representative determines that preservation-in-place of the tribal cultural resource is not a sufficient or feasible option, then the project sponsor shall prepare an interpretive program of the tribal cultural resource in consultation with affiliated Native America tribal representatives.	Less than Significant	Less than Significant

TABLE S-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROPOSED PROJECT AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation		Mitigation/Improvement Measures	Level of Significance With Mitigation	
	Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail		Fifield-Cahill Ridge Trail	Southern Skyline Ridge Trail
Tribal Cultural Resources (cont.)					
Impact TCR-1 (cont.)			The plan shall identify proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays. Upon approval by the ERO and prior to project occupancy, the interpretive program shall be prepared by the project sponsor.		
Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	Significant	Significant	**Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation Plan and/or Interpretive Program.**	Less than Significant	Less than Significant
Impact C-TCR-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on tribal cultural resources.	Less than Significant	Less than Significant	**None required.**	Less than Significant	Less than Significant

TABLE S-2
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Aesthetics							
Impact AE-1: Project construction would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact AE-2: Project operation would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact C-AE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on aesthetic resources.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Cultural Resources							
Impact CU-1: Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	Significant	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.**	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Cultural Resources (cont.)							
Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries.	Significant	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.**	Less than Significant	Less than Significant	Less than Significant
Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	Significant	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources.**	Less than Significant	Less than Significant	Less than Significant
Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries.	Significant	Significant	Significant	**Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains**	Less than Significant	Less than Significant	Less than Significant
Impact C-CU-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on historical resources, archeological resources, human remains.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Transportation and Circulation							
Impact TR-1: Construction of the project would not substantially conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of travel.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact TR-2: Project construction activities would not result in inadequate emergency access.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Transportation and Circulation (cont.)							
Impact TR-3: Project construction activities could result in potentially hazardous conditions for vehicles, bicyclists, and pedestrians.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact TR-4: Operation of the project would not cause a substantial adverse change in the significance of a transportation and circulation impact.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact TR-5: Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92.	Less than Significant	Significant	Significant	**Mitigation Measure M-TR-5a – Installation of Signage.** **Mitigation Measure M-TR-5b – Construction of a Pedestrian/Bicycle/Equestrian Bridge or Roundabout.**	Less than Significant	Significant and Unavoidable	Significant and Unavoidable
Impact C-TR-1: The project, in combination with past, present, and probable future projects, would not substantially affect transportation and circulation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Noise and Vibration							
Impact NO-1: Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	Significant	Significant	Significant	**Mitigation Measure M-NO-1 – Construction Noise Reduction.**	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Noise and Vibration (cont.)							
Impact NO-2: Construction activities would not result in excessive groundborne vibration.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact NO-3: Project operations would not result in a substantial permanent increase in ambient noise levels at the closest receptors or expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact C-NO-1: Construction of the project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels near the project area.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Air Quality							
Impact AQ-1: Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation.	Significant	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**	Less than Significant	Less than Significant	Less than Significant
Impact AQ-2: Project construction activities would not create objectionable odors that affect a substantial number of people.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Air Quality (cont.)							
Impact AQ-3: Project construction activities would not expose sensitive receptors to substantial pollutant concentrations.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact AQ-4: Emissions generated during project operation would not violate air quality standards and contribute substantially to an existing air quality violation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact AQ-5: Project operations would not create objectionable odors that affect a substantial number of people.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan.	Significant	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**	Less than Significant	Less than Significant	Less than Significant
Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions.	Significant	Significant	Significant	**Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.** **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**	Less than Significant	Less than Significant	Less than Significant
Greenhouse Gases							
Impact C-GG-1: Project construction and operation would not generate GHG emissions that could have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Biological Resources							
Impact BI-1: Construction of the project could result in substantial adverse impacts on special-status plants.	Significant	Significant	Significant	**Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.** **Mitigation Measure M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat.** **Mitigation Measure M-BI-1c – Revegetation Plan.** **Mitigation Measure M-BI-1d – Worker Environmental Training.**	Less than Significant	Less than Significant	Less than Significant
Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife.	Significant	Significant	Significant	**Mitigation Measure M-BI-1c – Revegetation Plan.** **Mitigation Measure M-BI-1d – Worker Environmental Training.** **Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.** **Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.** **Mitigation Measure M-BI-2c – Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger.** **Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.** **Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-status Bats and Maternity Roosts.**	Less than Significant	Less than Significant	Less than Significant
Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands.	Significant	Significant	Significant	**Mitigation Measure M-BI-3 – Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities.**	Less than Significant	Less than Significant	Less than Significant
Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants.	Less than Significant	Significant	Significant	**Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.** **Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.**	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Biological Resources (cont.)							
Impact BI-5: Project operations could result in substantial adverse impacts on special-status wildlife.	Significant	Significant	Significant	**Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.** **Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.** **Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.** **Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.** **Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.** **Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.** **Mitigation Measure M-BI-5c – Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians.** • The SFPUC shall reduce the likelihood of user-wildlife encounters and mitigate for permanent impacts on upland dispersal habitat for San Francisco garter snake and California red-legged frog in the Five Points area by preparing and implementing a five-year reptile and amphibian adaptive management plan. • The plan shall be prepared by a qualified biologist (i.e., with a four-year degree and one to two years of field experience with the affected species) and reviewed by SFPUC senior biologists. The plan shall also address mechanisms for protecting California red-legged frog and San Francisco garter snake populations. Such mechanisms may include additional fencing, signage, increased enforcement, rerouting the road or trail, seasonal trail closure or return to docent-led access, or a monitoring program to preclude unauthorized off-trail use and other unauthorized activities.	Less than Significant	Significant and Unavoidable	Significant and Unavoidable

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Biological Resources (cont.)							
Impact BI-5 (cont.)				• Such a monitoring program could include placing appropriate enforcement personnel at either end of the trail and at two- to three-mile intervals, and trail use could be conditional upon agreement to check in with monitors at reasonable intervals, which might vary depending on skill level and travel mode (i.e., hikers, bicyclists, or equestrians). Monitors would be connected (by phone or walkie-talkie) and identification would be required when users checked in. • The adaptive management plan shall include mitigation for habitat loss at a 1:1 ratio within the watershed in the form of habitat enhancement or restoration. The SFPUC shall file the finalized plan with the San Francisco Planning Department prior to project construction.			
Impact BI-6: The project would not result in operational impacts on sensitive natural communities, including riparian habitat and wetlands.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens.	Significant	Significant	Significant	**Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.** **Mitigation Measure M-BI-7a – Measures to Reduce Spread of Invasive Plants.** **Mitigation Measure M-BI-7b – Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death).** **Mitigation Measure M-BI-7c – Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens.**	Less than Significant	Significant and Unavoidable	Significant and Unavoidable
Impact BI-8: Construction of the project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Biological Resources (cont.)							
Impact C-BI-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on biological resources.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Geology, Soils, and Paleontology							
Impact GE-1: Project construction would not result in substantial erosion or loss of topsoil during construction.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact GE-2: The project is located on a geologic unit that is potentially unstable, but would not increase the potential for landsliding, collapse, or other slope failures during construction.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact GE-3: Construction of the project would not substantially alter the topography of the proposed trail alignment.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact GE-4: The project would not directly or indirectly destroy a unique paleontological resource during construction.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact GE-5: The project would not expose people or structures to the risk of loss, injury, or death involving seismic groundshaking, seismically induced landslides, or potentially unstable geologic units during operation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Geology, Soils, and Paleontology (cont.)							
Impact GE-6: Runoff from the permanent project components would not result in substantial erosion or loss of topsoil during operation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact GE-7: Use of the trails under the proposed access program and variants would not result in substantial erosion or loss of topsoil during operation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact C-GE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on geology, soils, or paleontological resources.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Hydrology and Water Quality							
Impact HY-1: Construction of the project would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, or alter existing drainage patterns.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HY-2: Stormwater runoff from permanent project components would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Hydrology and Water Quality (cont.)							
Impact HY-3: Use of the trails under the proposed access program and variants would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact C-HY-1: The project, in combination with past, present, and probable future projects in the site vicinity, would not result in significant adverse cumulative hydrology impacts.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Hazards and Hazardous Materials							
Impact HZ-1: Project construction would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HZ-2: Project construction 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 present in the soil.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Hazards and Hazardous Materials (cont.)							
Impact HZ-3: Project construction would not result in a significant hazard to the public or the environment through reasonably foreseeable conditions involving the release of naturally occurring asbestos.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HZ-4: Project construction would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HZ-5: Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	Significant	Significant	Significant	**Mitigation Measure M-HZ-5 – Fire Safety During Construction.**	Less than Significant	Less than Significant	Less than Significant
Impact HZ-6: The project 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 present in the soil during operation.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HZ-7: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	Less than Significant	Significant	Significant	**Mitigation Measure M-HZ-8: Fire Management Plan.**	Less than Significant	Less than Significant	Less than Significant

TABLE S-2 (CONTINUED)
SUMMARY OF IMPACTS OF ACCESS PROGRAM VARIANT 1, VARIANT 2, AND VARIANT 3 AND MITIGATION MEASURES IDENTIFIED IN THIS EIR

Environmental Impacts	Level of Significance Without Mitigation			Mitigation/Improvement Measures	Level of Significance With Mitigation		
	Access Program Variant 1	Access Program Variant 2	Access Program Variant 3		Access Program Variant 1	Access Program Variant 2	Access Program Variant 3
Hazards and Hazardous Materials (cont.)							
Impact C-HZ-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts related to hazards and hazardous materials.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant
Tribal Cultural Resources							
Impact TCR-1: Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	Significant	Significant	Significant	**Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation Plan and/or Interpretive Program.**	Less than Significant	Less than Significant	Less than Significant
Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	Significant	Significant	Significant	**Mitigation Measure M-TCR-1: Tribal Cultural Resources Preservation Plan and/or Interpretive Program.**	Less than Significant	Less than Significant	Less than Significant
Impact C-TCR-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on tribal cultural resources.	Less than Significant	Less than Significant	Less than Significant	None required.	Less than Significant	Less than Significant	Less than Significant

TABLE S-3
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Cultural Resources	**Impact CU-1:** Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	No impact.	Reduced due to somewhat smaller project footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation.
	Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries.	No impact.	Reduced due to somewhat smaller project footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation
Transportation and Circulation	**Impact TR-5:** Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92.	No impact.	Hazard posed by visitors crossing S.R. 92 would be eliminated; reduced impact related to vehicles turning to and from relocated parking lot; less than significant.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use; significant and unavoidable with mitigation).	Slightly reduced, hazard posed by visitors crossing S.R. 92 would be shifted to new trail alignment; significant and unavoidable with mitigation; hazards posed by vehicles turning into parking lot would be reduced; significant and unavoidable with mitigation.
Noise and Vibration	**Impact NO-1:** Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	No impact.	Reduced, due to relocation of parking lot and trailhead, and would avoid construction noise impacts associated with installation of prefabricated bridge; less than significant with mitigation.	Same as project.	Substantially reduced due to distance from sensitive receptors, reduced construction duration, and smaller project footprint; less than significant with mitigation.

TABLE S-3 (CONTINUED)
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Air Quality	**Impact AQ-1:** Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation.	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant with mitigation.
	Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan.	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant with mitigation.
	Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions. (Less than significant with mitigation for the proposed access program and variants)	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant.
Biological Resources	**Impact BI-1:** Construction of the project could result in substantial adverse impacts on special-status plants.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Increased due to potential impacts on additional special-status plants in alternative alignment, less than significant with mitigation.
	Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Similar to project for special-status amphibians and reptiles due to preferred habitat proximity, less than significant with mitigation.
	Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Similar to project due to sensitive natural communities in vicinity of alternative alignment, less than significant with mitigation.
	Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants.	No impact.	Same as project; the project footprint north of S.R. 92 would not change.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use); less than significant with mitigation.	Increased due to potential impacts on additional special-status plants in alternative alignment; less than significant with mitigation.

TABLE S-3 (CONTINUED)
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Biological Resources *(cont.)*	**Impact BI-5:** Project operations could result in substantial adverse impacts on special-status wildlife.	No impact.	Same as project for special-status wildlife on Fifield-Cahill ridge trail; reduced impacts for San Francisco garter snake, California red-legged frog, and nesting birds along southern skyline ridge trail due to somewhat smaller project footprint. Significant and unavoidable with mitigation.	Potential for significant effects on special-status amphibian and reptile species from bicyclists and equestrians eliminated; potential effects on other special-status species would be same as project; significant and unavoidable with mitigation.	Potential for significant effects on special-status butterfly reduced; would be similar or increased for special-status amphibians and reptiles due to preferred habitat proximity. Potential effects on other special-status species would be similar to the project but substantially reduced due to smaller project footprint. Significant and unavoidable with mitigation.
	Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens.	No impact.	Reduced due to somewhat decreased project footprint; significant and unavoidable with mitigation.	Slightly reduced because hikers would not likely travel as far as bicyclists or equestrians, thereby limiting the potential extent of spread; significant and unavoidable with mitigation.	Substantially reduced because the extent of new trails would be considerably smaller, unfavorable to hosting plant pathogens (e.g., paved or graveled), and present limited opportunity for spread if transmission occurred. Less than significant with mitigation.
Hazards and Hazardous Materials	**Impact HZ-5:** Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	No impact.	Reduced due to somewhat decreased construction area; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	No impact.	Reduced due to somewhat decreased project footprint; less than significant with mitigation.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use); less than significant with mitigation.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation.
Tribal Cultural Resources	**Impact TCR-1:** Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.

CHAPTER 1
Introduction

1.1 Project Summary

The San Francisco Public Utilities Commission (SFPUC) proposes the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The project area includes lands owned by the City and County of San Francisco and under the jurisdiction of the SFPUC within the Peninsula Watershed in San Mateo County. One portion of the project area lies south of State Route 92 (S.R. 92), and another occurs in a separate area north of S.R. 92. The primary project components north of S.R. 92 are access improvements to the Fifield-Cahill ridge trail, located approximately 1.5 miles north of the S.R. 92/State Route 35 (S.R. 35)[1] intersection. The improvements include a new 0.5-mile universal access loop trail (including Americans with Disabilities Act-compliant access and parking) along the existing Fifield-Cahill ridge trail, a new 50-car parking lot, one new restroom, and the transfer of a public access easement (from the Bay Area Ridge Trail Council to SFPUC) along an existing segment of the Bay Area Ridge Trail through Skylawn Memorial Park. Project components south of S.R. 92 include a new 20-car parking lot south of the S.R. 92/S.R. 35 intersection, two restrooms, and a new 6-mile southern skyline ridge trail.

The SFPUC proposes an access management program that would differ in the degree of access restriction for the Fifield-Cahill ridge trail and the southern skyline ridge trail. The SFPUC would restrict access to the Fifield-Cahill ridge trail to visitors with a reservation and under the supervision of a trained volunteer (i.e., docent), similar to current access restrictions. Access to the southern skyline ridge trail would be unsupervised but restricted to visitors who have obtained an access permit in advance.

In response to public comments requesting the SFPUC consider multiple access options, and to allow flexibility in crafting an access program that responds to ongoing watershed management requirements as well as environmental and economic considerations, this environmental impact report (EIR) evaluates three additional access program configurations, or variants, with differing levels of restrictiveness. The variants would apply to existing and new trail areas north and south of S.R. 92, and cover the range of potential access controls—from supervised to unsupervised. The access program variants include: (1) supervised access, similar to the existing docent program (access program variant 1 [docent program]); (2) unsupervised and unrestricted access (access program variant 2 [unsupervised/unrestricted access]); and (3) unsupervised and restricted/permit access (access program variant 3 [unsupervised/restricted access]). Security

[1] S.R. 35 is also Skyline Boulevard in this location.

measures (e.g., fencing and gates) would vary based upon the access program. Chapter 2, Project Description, provides a detailed description of the project.

If the Final EIR is certified, the SFPUC would consider project approval and selection of a final access program configuration for trails and amenities north and south of S.R. 92 based on information obtained through the environmental analysis, additional cost and engineering feasibility considerations, and continued community engagement.

1.1.1 Background

The SFPUC is charged with managing protected watershed lands extending from the Sierra Nevada mountains in the east to the San Francisco Peninsula in the west. The latter includes the Peninsula Watershed, which encompasses 23,000 acres in San Mateo County. The SFPUC developed the Peninsula Watershed Management Plan in the 1990s to address the management of watershed lands in a comprehensive and integrated manner. The management plan consists of a collection of goals, policies, and management actions that address both long-term management objectives and day-to-day operations and maintenance activities. Among these management plan components are specific policies and management actions in response to the Bay Area Ridge Trail Council's request that the Bay Area Ridge Trail be routed through a portion of the Peninsula Watershed. The construction and management of trail segments and associated facilities, which would extend and enhance the Bay Area Ridge Trail, are the primary focus of this EIR.

In response to the trail council's request, the management plan includes alignment and access management options (or "alternatives" as described in that document) for two segments of trail across the Peninsula Watershed, referred to in this EIR as the Fifield-Cahill ridge trail and the southern skyline ridge trail. The Peninsula Watershed Management Plan describes the first trail segment (Fifield-Cahill ridge trail) as extending from Golden Gate National Recreation Area's Sweeney Ridge Trail south through the watershed along the Fifield-Cahill service road to S.R. 92. The management plan identifies access management program alternatives for the Fifield-Cahill ridge trail, ranging from unsupervised access to docent-led access (management plan trail alternatives A to D). The plan describes the second trail segment, the southern skyline ridge trail, as beginning south of the S.R. 92/S.R. 35 intersection and extending south across SFPUC and/or private property to a point of connection with a trail leading to Kings Mountain (trail alternative A/B). The plan describes public access for the southern skyline ridge trail segment as unsupervised. Chapter 2, Project Description, further discusses the management plan's trail alternatives and management actions.

The San Francisco Planning Department prepared an EIR (management plan EIR) evaluating the physical effects of the management plan on the environment.[2] The management plan describes the Fifield-Cahill ridge trail at a greater level of detail than other proposed actions; therefore, the management plan EIR analyzes trail alternatives A to D at a project level of detail. The management

[2] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343*, accessed May 18, 2018.

plan EIR evaluates the southern skyline ridge trail at a program level of detail. Based on the analysis in the draft EIR, the planning department identified trail alternative D (docent-led access with termination at Skyline Quarry) as the environmentally superior trail alternative.

After the 2001 management plan EIR certification, members of the community proposed a fifth Fifield-Cahill ridge trail alternative, known as trail alternative E (guided multi-modal access).[3] The planning department examined the new Fifield-Cahill ridge trail alternative and determined that trail alternative E fell within the range of trail alternatives analyzed and was similar to trail alternative D analyzed in the management plan EIR (and whose mitigation measures would apply to trail alternative E), and therefore concluded the management plan EIR adequately analyzed the environmental effects of trail alternative E. The SFPUC adopted trail alternative E in 2002.[4]

The SFPUC constructed the trail alternative E improvements, and guided tours began in 2003. As constructed, the Fifield-Cahill ridge trail extends approximately 10 miles, from the Portola Gate at Sweeney Ridge to Skyline Quarry near S.R. 92. As envisioned in the management plan, the trail is accessible to small groups of hikers, bicyclists, or equestrians (up to three groups of 20 people, fewer on horseback, per day), up to three days per week, with a reservation and a trained docent or volunteer trail leader.

The SFPUC has since identified funding opportunities that now make implementation of trail alternative A/B (unsupervised access along programmatic southern skyline ridge trail alignment) more feasible. Thus, the agency has further defined the southern skyline ridge trail concept, including more specific details regarding the proposed location, construction, and operation, such that project-level environmental review is now possible. In addition, the SFPUC has also identified and proposes to implement a number of access improvements for the Fifield-Cahill ridge trail. In combination with the proposed southern skyline ridge trail and Fifield-Cahill ridge trail improvements, the SFPUC is considering revisions to the access management program that could apply to both existing and proposed facilities. These trail extensions and access improvements are analyzed in this EIR.

1.2 Purpose of this Environmental Impact Report

Under the San Francisco Administrative Code, chapter 31, the San Francisco Planning Department, through its Environmental Planning Division, is the lead agency responsible for implementing California Environmental Quality Act (CEQA) requirements for all projects sponsored by the City and County of San Francisco or within San Francisco, including those sponsored by the SFPUC. The San Francisco Planning Department determined that preparation of this EIR for the Southern Skyline Boulevard Ridge Trail Extension Project, for which the SFPUC is the project sponsor, is required for the project to comply with CEQA. CEQA requires the preparation of an EIR when a proposed project could significantly affect the physical environment.

[3] San Francisco Public Utilities Commission, Peninsula Watershed Management Plan, Spring 2002, https://sfwater.org/modules/showdocument.aspx?documentid=756, accessed May 18, 2018, p. 9-4.

[4] Ibid, pp. 10-1 to 10-3.

The planning department has prepared this EIR to tier from the Peninsula Watershed Management Plan EIR in accordance with CEQA Guidelines section 15168(c), which provides for environmental review of subsequent activities under the same program. The management plan EIR evaluates the impacts of new trails and amenities, including project elements, along with various access management alternatives at both program and project levels of detail, based on the information available at that time. This EIR presents the project as it is now envisioned and analyzes its effects at a project level of detail to provide decision-makers, the public, and responsible and trustee agencies reviewing the project with information about its potential impacts on the environment. This EIR describes the potential environmental impacts resulting from project implementation, identifies mitigation measures for reducing impacts to a less-than-significant level where feasible, and evaluates alternatives to the project that meet the criteria set forth in CEQA Guidelines section 15126.6(a).

1.3 Notice of Preparation and Public Scoping Process

In accordance with section 15082 of the CEQA Guidelines, the planning department published a Notice of Preparation of an EIR for the project to responsible agencies and interested parties on December 21, 2016. In addition, on March 30, 2017 the planning department expanded its public outreach by mailing the Notice of Preparation to owners and occupants of properties within 300 feet of project sites. Distribution of the Notice of Preparation initiated the official scoping process, which allows the public and government agencies to comment on the scope and content of the EIR. The public scoping process included two 30-day public scoping periods—from December 21, 2016 to February 3, 2017 and from March 30, 2017 to April 29, 2017, respectively. The planning department also held a public scoping meeting on January 18, 2017 at the SFPUC offices in San Francisco, California. The Notice of Preparation included a preliminary discussion of the potential environmental impacts of the project with respect to the following resource topics: tribal and other cultural resources; biological resources; hydrology and water quality; fire management; and transportation and access.

During the scoping period, interested parties provided a total of 56 comments, including letters, emails, and oral comments. The comment letters, emails, and transcript of the comments received at the public scoping meeting are available for review as part of case file no. 2016-016100ENV. The planning department has considered the comments made by the public in preparation of the draft EIR for the project. Comments on the Notice of Preparation that relate to environmental issues are addressed and analyzed throughout this EIR. In addition, the planning department summarized the public scoping process and the comments received during the scoping process in a scoping report. Table 1-1 summarizes key environmental concerns raised during the scoping period and cross-references applicable EIR sections where these comments are addressed. Appendix A of this EIR provides the Notice of Preparation and scoping report.

TABLE 1-1
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Federal Agencies		
National Park Service (Craig Kenkel)	Describes the scenic and recreation easements in the Peninsula Watershed granted to the U.S. Department of the Interior, along with the authorities of the National Park Service/Golden Gate National Recreation Area (GGNRA) and the City and County of San Francisco under the easements.	• Plans and Policies
	States that the project is in the scenic easement and describes the restrictions for National Park Service approval for uses and actions in the watershed.	• Plans and Policies
	Requests coordination between San Francisco and GGNRA to seek concurrence regarding the project being a federal action.	• Comment noted; beyond EIR scope
	States that the project could be in compliance with easement requirements for water-related rights with appropriate mitigation.	• Plans and Policies
	States that the GGNRA General Management Plan (2014) supports the connection of the southern skyline ridge trail to the Phleger Estate and requests coordination between SFPUC and GGNRA on this topic.	• Comment noted; beyond EIR scope
	Requests analysis of different access procedures on visitor use, experience, and connectivity with adjacent lands and trails, including the Phleger Estate.	• Project Description
	Requests analysis of consistency of proposed range of uses with adjacent lands and trails, including the Phleger Estate.	• Project Description
	Requests that the EIR evaluate potential visual impacts on the scenic easement and include the development of appropriate mitigation measures.	• Plans and Policies • Aesthetics
State Agencies		
California Department of Transportation (Caltrans) (Patricia Maurice)	Requests a figure with the trail segment improvements numbered as listed in the Project Description of the NOP with Caltrans right-of-way and access points to the right-of-way clearly mapped.	• Project Description
	Requests that the current number of trail users and the expected number of visitors be included in the EIR.	• Project Description • Transportation and Circulation
	States that San Francisco is responsible for all implementation, scheduling, and financing of mitigation and needed improvements to the state transportation network.	• Comment noted; beyond EIR scope
	Any required improvements should be completed prior to issuance of the building permit.	• Comment noted; beyond EIR scope
	Recommends early coordination between Caltrans and San Francisco to address site access issues prior to submittal of an encroachment permit application.	• Comment noted; beyond EIR scope
	Requests identification of the project-generated truck trips during construction along S.R. 92 and S.R. 35 between 9:30 a.m. and 2:30 p.m.	• Project Description • Transportation and Circulation

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
State Agencies (cont.)		
Caltrans (Patricia Maurice) (*cont.*)	Requests identification of the expected number of daily worker vehicle trips and daily truck trips that will use S.R. 92 and S.R. 35 during construction.	• Project Description • Transportation and Circulation
	Requests the exact locations of construction activities requiring the closure of S.R. 35, including the hours and types of closures (mainline or shoulder).	• Transportation and Circulation
	Requests identification of the proposed detour route during construction.	• Transportation and Circulation
	Describes transportation demand management elements and measures that should be included in project design.	• Transportation and Circulation
	A Caltrans-approved transportation management plan is required for incidents where vehicle, bicycle, and pedestrian traffic may be impacted during construction.	• Transportation and Circulation
	Pedestrian and bicycle access through construction zone must be maintained at all times to comply with Americans with Disabilities Act regulations.	• Transportation and Circulation
	All curb ramps and pedestrian facilities located within project limits are required to be brought up to current Americans with Disabilities Act standards.	• Comment noted; beyond EIR scope
	The transportation management plan must comply with the requirements of the corresponding jurisdictions.	• Transportation and Circulation
	San Francisco should conduct a cultural resource technical study that includes a record search from the Northwest Information Center of the California Historical Resources Information System and a field survey conducted by a qualified archeologist and architectural historian.	• Tribal and Cultural Resources
	San Francisco is required to conduct Native American consultation with tribes, groups, and individuals who are interested and may have knowledge of the project area.	• Tribal and Cultural Resources
	The Natural Trust for Historic Preservation, the owners of the Filoli Estate, should be consulted because it is a historic landmark listed on the National Register of Historic Places.	• Tribal and Cultural Resources
	A transportation permit issued by Caltrans is required for project work that requires movement of oversized or excessive load vehicles on state roadways.	• Project Description
	Any work or traffic control that encroaches onto the state right-of-way requires an encroachment permit issued by Caltrans.	• Project Description
	Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process.	• Comment noted; beyond EIR scope
	San Francisco should coordinate early with Caltrans on new site access from S.R. 35.	• Comment noted; beyond EIR scope

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
State Agencies (cont.)		
Department of Forestry and Fire Protection/ Cal Fire (Richard Sampson)	States that the land proposed for the project is classified as "Timberland" under Public Resource Code section 4526 and that a timberland conversion permit or conversion permit is required prior to cutting any trees.	• Project Description
	States that the project is in wildlands and that compliance with applicable fire codes will be required and mitigation and protection measures to comply with such rules must be part of the building permit.	• Hazards and Hazardous Materials
Department of Fish and Wildlife (Scott Wilson)	Recommends that the EIR provide baseline habitat assessments from a range of sources for special-status species located or potentially located within the project area and surroundings lands.	• Biological Resources
	Recommends that surveys for special-status species occur prior to project implementation.	• Biological Resources
	Notes that EIR must discuss all direct and indirect impacts, and cumulative impacts that may occur with implementation of the project, including impacts on wildlife and habitat.	• Biological Resources • Cumulative Scenario
	Recommends that mitigation measures designed to avoid taking and to minimize impacts on special-status species should be developed in consultation with U.S. Fish and Wildlife Service the National Marine Fisheries Service, and California Department of Fish and Wildlife.	• Biological Resources
	States that fully protected species may not be taken or possessed at any time and mitigation measures must ensure complete take avoidance of such species.	• Biological Resources
	States that a California Endangered Species Act permit must be obtained if the project could result in the "take" of species listed under the act.	• Biological Resources
	States that the CEQA lead agency's findings of overriding consideration do not eliminate obligations to comply with Fish and Game Code section 2080.	• Project Description
	Describes lake and streambed alteration agreement requirements.	• Project Description
Local/Regional Agencies/Organizations		
Bay Area Ridge Trail Council (Bern Smith)	Describes the successful SFPUC Bay Area Ridge Trail access program, which included trailhead and restroom construction and a docent program.	• Project Description
	Expresses support for the docent program, but also supports dawn to dusk access.	• Comment noted; beyond scope of EIR
	States that the docent program should no longer be required for the Bay Area Ridge Trail and expressed support for a permit program.	• Comment noted; beyond scope of EIR
	Describes the benefits of narrow trails over wide trails.	• Project Description

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Local/Regional Agencies/Organizations (cont.)		
Bay Area Ridge Trail Council (Bern Smith) (*cont.*)	Describes the impacts of heavy construction equipment on air quality, soils, and water quality.	• Project Description • Air Quality • Geology, Soils, and Paleontological Resources • Hydrology and Water Quality
	Requests a study to examine safe crossing for trail users at S.R. 92 and S.R. 35.	• Transportation and Circulation
Audubon Society (Golden Gate, Santa Clara Valley, and Sequoia Chapters); California Native Plant Society (Santa Clara Valley and Yerba Buena Chapters); Committee for Green Foothills; Native Plant Conservation Campaign; Nature in the City; and Sierra Club (San Francisco Bay and Loma Prieta Chapters)	Requests that the EIR address how climate change, the intensity of droughts, extreme weather, and wildfire can affect water quality and wildlife.	• Greenhouse Gas Emissions • Hydrology and Water Quality • Hazards and Hazardous Materials
	Expresses concern that the watershed's fire management plan is outdated.	• Hazards and Hazardous Materials
	Requests that the EIR determine the consistency of unsupervised access with the 1969 scenic easement held by the federal government.	• Plans and Policies
	Requests that the EIR explore how unsupervised access can affect water quality and hydrology, soils, wildlife, the spread of invasive species, and the spread of sudden oak death.	• Hydrology and Water Quality • Geology, Soils, and Paleontological Resources • Biological Resources
	Requests that the EIR consider impacts that retaining walls, fences, and other structures have on wildlife.	• Biological Resources
	Describes the effectiveness of the docent program, expresses support for its expansion, and notes that it is consistent with the scenic easement.	• Project Description
	Requests that baseline analysis include the docent program.	• Project Description • Environmental Setting and Impacts
	Describes how unsupervised access to the Peninsula Watershed is incompatible with a docent program.	• Comment noted; beyond EIR scope
	Requests assessment of the level of park personnel necessary to enforce regulations and ensure visitor safety for an unsupervised access management program.	• Project Description
SF Urban Riders (Matthew Blain)	Requests that the EIR focus on potential conflicts among different types of trail users and off-trail use into habitat areas.	• Project Description • Biological Resources • Hazards and Hazardous Materials
	Describes how design features such as trail width, materials, and routing can affect user experience.	• Comment noted; beyond EIR scope
	Requests that the EIR consider how a limited access program affects those who do not have flexible schedules.	• Comment noted; beyond EIR scope

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Local/Regional Agencies/Organizations (cont.)		
SF Urban Riders (Matthew Blain) (*cont.*)	Requests that the EIR be used as a basis for other trail projects in the watershed.	• Comment noted; beyond EIR scope
Sierra Club – Loma Prieta and San Francisco Bay Chapters (Mike Ferreira)	Expresses support for the docent program.	• Comment noted; beyond EIR scope
	Requests that the EIR thoroughly assesses impacts on natural resources.	• Environmental Setting and Impacts
	Requests that the EIR include a No Project Alternative.	• Alternatives
Golden Gate Audubon Society (Sean Herman)	Requests further exploration of the extent of the biodiversity of the area.	• Biological Resources
	Expresses concern for unsupervised access and impacts on biodiversity.	• Biological Resources
	Expresses concern for increased fire risk with unsupervised access and a need for adequate enforcement, funding, personnel, and training.	• Hazards and Hazardous Materials
Open SF Watershed (Chris Brousseau)	Requests that the EIR assess hiking, biking, and equestrian access.	• Project Description • Environmental Setting and Impacts
	Requests that the EIR discuss how the trail affects wildlife.	• Biological Resources
	Requests that the Skyline Quarry be evaluated for the same access programs as the project trails.	• Project Description
	Requests that the EIR use "open access" instead of "unrestricted access," as the latter has a negative connotation.	• Project Description
Palo Alto Run Club (Ron Wolf)	Expresses support for opening further access to the watershed.	• Comment noted; beyond EIR scope
	Requests that the EIR address the entire extension of the trail, from the northern gate at Sweeney Ridge to the southern gate at Skylawn Memorial Park.	• Project Description • Environmental Setting and Impacts
	Requests that access should be extended from dawn until dusk.	• Project Description
	Requests that the EIR be expanded to cover connecting to trail systems.	• Environmental Setting and Impacts
Silicon Valley Mountain Bikers (Charles Krenz)	Requests that the EIR describe the SFPUC's jurisdictional duties to regulate recreational access in the Peninsula Watershed.	• Project Description
	Describes that both the San Francisco and San Mateo general plans encourage recreational access on watershed lands.	• Plans & Policies
	Requests that the EIR consider the impact of cycling in addition to hiking and should not use the terminology "mountain biking."	• Project Description • Transportation and Circulation
	Requests that the EIR consider the retention of the Skyline Quarry access location for cyclists so that riders do not attempt to climb on S.R. 92.	• Project Description • Transportation and Circulation

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Local/Regional Agencies/Organizations (cont.)		
Midpeninsula Regional Open Space District (Jane Mark)	Expresses support for the project since it would provide key regional trail connection between two segments of the Bay Area Ridge Trail.	• Comment noted; beyond EIR scope
	Requests that the EIR analyze potential impacts on the District's adjacent recreational facilities, including potential traffic and parking impacts on the north parking lot for the Purisima Creek Redwoods Open Space Preserve.	• Traffic and Circulation
	Requests coordination meeting with SFPUC to discuss regional trail crossing and potential impacts on north parking lot.	• Comment noted; beyond EIR scope
Individuals		
Brian Ginna	Similar to Palo Alto Run Club letter.	• See Palo Alto Run Club letter summary
	Requests that the EIR address pedestrian, cyclist, and equestrian access.	• Project Description • Transportation and Circulation
	Requests that the EIR address all historical sites and artifacts in the watershed that are over 50 years old.	• Tribal and Cultural Resources
Bryan O'Sullivan; Chris Clutton; Dan Spier; Daniel Hadley; Eric Stempke; John Collins; Jordan Kestler; Kaaren Sipes; Leslie Young; Meg Gilmore; Michelle Boyle; Paul J. Farragher; Raymond Sinsley; Ryan Helft; Sean Matthews; Todd Lansing; Tom Brown; Jamie Fox; Rezz Sakharov; Ted Ryan; Mythily Sivarahah; Scott Dickie; Bill Schilz; Joel Reed; Jeremy Schaub; Callista Shepherd Smith; Scott Smith; Jason Strnad; Anne Barnett; Tom Scarvie; Mike Naranjo; Ross Heiman; Andy Howse; Paul Soo; Ketayun Keown; Vladimir Gedgafov	Similar to Palo Alto Run Club and Brian Ginna letters.	• See Palo Alto Run Club and Brian Ginna letter summaries
Terry Barton	Similar to Palo Alto Run Club and Brian Ginna letters.	• See Palo Alto Run Club and Brian Ginna letter summaries
	Describes how access to public lands raises environmental awareness and benefits the population.	• Comment noted; beyond EIR scope

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Individuals (cont.)		
John Scott	Similar to Palo Alto Run Club and Brian Ginna letters.	• See Palo Alto Run Club and Brian Ginna letters summaries
	Describes how volunteer trail maintenance workdays can foster responsible trail use.	• Comment noted; beyond EIR scope
Daniel Engovatov, Ph.D.	Similar to Palo Alto Run Club and Brian Ginna letters.	• See Palo Alto Run Club and Brian Ginna letter summaries
	Requests that the EIR should study the least restrictive access mode in addition to permit-based access.	• Project Description
	Describes how public access to nature is important for a new generation of environmentally conscious citizens.	• Comment noted; beyond EIR scope
Christopher Pincetich, Ph.D.	Similar to Palo Alto Run Club and Brian Ginna letters.	• See Palo Alto Run Club and Brian Ginna letter summaries
	Describes the benefits of cycling.	• Comment noted; beyond EIR scope
Mike Buncic	Requests that the EIR explore access to Fifield-Cahill ridge trail at the northern Sweeney Ridge trail connection.	• Project Description
Charlie Krenz	Describes that both the San Francisco and San Mateo general plans include provisions for accessibility and recreation on Peninsula Watershed lands.	• Plans & Policies
	Requests that the EIR assess hiking, equestrian, and bicycling access; a permit access program; and an unsupervised access program.	• Project Description • Environmental Setting and Impacts
	Describes aspects of the Peninsula Watershed Management Plan that allow recreational access to watershed lands.	• Project Description • Plans & Policies
Gene McKenna	Supports responsible access to the watershed in the form of open access, not docent access.	• Comment noted; beyond EIR scope
Paul Dawes	Commenter supports the project and favors multiuse access, including mountain biking.	• Comment noted; beyond EIR scope
Nick & Marilyn Alafouzos	Prefers supervised access to minimize impacts on wildlife.	• Biological Resources
	Expresses concern about campfires.	• Hazards and Hazardous Materials
	Policing unsupervised access would be too expensive.	• Project Description
Stacy McCarthy	Expresses support for the trail extension with dogs allowed on leash only.	• Project Description
Beverly Abbott & J.R. Elpers	Expresses support for unsupervised access because arranging docent service is an obstacle to recreation.	• Project Description
Dr. James Bartlett & Theodore Hax	Expresses support for docent program and is concerned that unsupervised access will increase fire risk, pollution, and degradation of the watershed.	• Hazards and Hazardous Materials • Hydrology and Water Quality

TABLE 1-1 (CONTINUED)
SUMMARY OF SCOPING COMMENTS

Commenter	Summary of Comment	CEQA Subject Area(s)
Individuals (cont.)		
Anna Roesch-Tubbs & Alan Tubbs	Concern for project's proximity to residences and the potential for increases in litter, traffic, and safety and security concerns.	• Project Description • Biological Resources • Transportation and Circulation
Andrew Nourse	Commenter supports the project and would be able to use the southern skyline ridge trail to bike or walk to public transit connections instead of driving.	• Comment noted; beyond EIR scope
Carrie & Tim German	Variant 1 will protect drinking water supply but would limit local access to trails.	• Project Description • Hydrology and Water Quality
	Variant 2 should allow unsupervised access to local community, but restricted access to general public to ensure adequate maintenance, safety, and emergency services	• Project Descriptions • Hazards and Hazardous Materials • Transportation and Circulation
	Under Variant 2, a 20-car parking lot would be inadequate.	• Transportation and Circulation
	A 50-car parking lot north of S.R. 92 would create a dangerous pedestrian crossing situation. Suggests resurrecting the Caltrans overpass project.	• Transportation and Circulation
	Requests measures to discourage parking on Kings Mountain Volunteer Fire Brigade site at 13889 Skyline Boulevard.	• Comment noted; beyond EIR scope
	Expresses desire for regular forest maintenance to reduce fire hazards caused by traffic along Skyline Boulevard.	• Hazards and Hazardous Materials

1.4 Draft EIR and Final EIR

This draft EIR is available for public review and comment during the public review period noted on the cover, during which time the San Francisco Planning Commission will hold a public hearing on the draft EIR to receive oral public comment. Following the close of the public comment period, the planning department will prepare and publish a responses to comments document, which will contain written responses to all substantive comments received on the draft EIR as well as copies of the comments received. The document may also contain specific changes and revisions to the draft EIR.

The planning commission will consider this draft EIR, together with the responses to comments document (including revisions to the draft EIR), in a advertised public meeting and will certify the two documents as the final EIR if it is deemed adequate.

1.5 Organization of the Draft EIR

This draft EIR has been organized as follows:

- **Summary** – summarizes the EIR by providing a concise overview of the project, the environmental impacts that would result from the project, mitigation measures identified to reduce or eliminate these impacts, and project alternatives.
- **Chapter 1, Introduction** – provides background information, describes the purpose and organization of the EIR, and discusses the environmental review process.
- **Chapter 2, Project Description** – discusses the background and objectives of the project, provides background data on the project location, describes the operational and physical characteristics of the project, and identifies project approvals.
- **Chapter 3, Plans and Policies** – provides a summary of the plans, policies, and regulations of the City and County of San Francisco; the SFPUC; and state, regional, and local agencies that may apply to the project.
- **Chapter 4, Environmental Setting and Impacts** – describes the project's existing setting, environmental impacts, cumulative impacts, and mitigation measures. This chapter also addresses topics for which detailed impact analysis is not warranted because both the management plan EIR and initial review for this EIR found that the project would not cause significant effects related to those resource topics. Separate sections in Chapter 4 discuss the remaining environmental topics:
  - Aesthetics
  - Cultural Resources
  - Transportation and Circulation
  - Noise
  - Air Quality
  - Greenhouse Gas Emissions
  - Biological Resources
  - Geology, Soils, and Paleontological Resources
  - Hydrology and Water Quality
  - Hazards and Hazardous Materials
  - Tribal Cultural Resources
- **Chapter 5, Other CEQA Issues** – discusses growth-inducing effects, identifies the significant environmental effects that cannot be avoided if the project is implemented, and describes significant irreversible impacts.
- **Chapter 6, Alternatives** – presents alternatives to the project, including trail Alternative A: No Project; Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92; Alternative C: Pedestrian Only Trail Access; and Alternative D: Alternative Trail Alignment. In addition, the environmentally superior alternative is identified.
- **Chapter 7, Report Preparers** – identifies the CEQA lead agency, the project sponsor, and the consultants who assisted the lead agency in the preparation of the EIR.

Appendices A through E present technical and supporting information for the EIR.

1.6 Public Participation

The CEQA Guidelines and chapter 31 of the San Francisco Administrative Code encourage public participation in the planning and environmental review processes. The City and County of San Francisco will provide opportunities for the public to present comments and concerns regarding the project during the CEQA process. These opportunities will occur during a public review and comment period and a public hearing before the planning commission. The EIR is available for public review and comment on the planning department's SFPUC negative declarations and EIRs web page (https://sfplanning.org/environmental-review-documents). A USB or paper copy of the Draft EIR will be mailed upon request. Referenced materials will also be made available for review upon request. Please contact the project planner, Timothy Johnston, at timothy.johnston@sfgov.org or (415) 575-9035.

Written public comments may be submitted to the planning department to the attention of Timothy Johnston, Senior Environmental Planner, at 1650 Mission Street, Suite 400, San Francisco, CA 94103 (or by email to timothy.johnston@sfgov.org), during the specified public review and comment period (indicated on the cover of this EIR), and written and oral comments may be presented at public hearings concerning the project (also indicated on the cover of this EIR).

CHAPTER 2
Project Description

This chapter describes the Southern Skyline Boulevard Ridge Trail Extension Project ("project") proposed by the San Francisco Public Utilities Commission (SFPUC), including the project's background, location, objectives, components, construction methods, construction schedule, and operations details. The chapter also identifies the regulatory actions and approvals that may be required for project implementation.

2.1 Project Summary

This environmental impact report (EIR) considers the potential environmental effects of the proposed project, which includes a proposed access program, and three access program variants. The four primary components of the proposed project are:

- A new 6-mile-long ridge trail along State Route 35 (S.R. 35)[1] to be served by a new 20-car parking lot and two new restrooms
- A new 0.5-mile universal access loop trail (that provides Americans with Disabilities Act-compliant access and parking) along the existing Fifield-Cahill ridge trail, a new 50-car parking lot, and one new restroom
- The transfer, from the Bay Area Ridge Trail Council to the SFPUC, of a public access easement along an existing segment of the Bay Area Ridge Trail through Skylawn Memorial Park
- Access program modifications involving supervised access, similar to the existing docent program, along an unfenced Fifield-Cahill ridge trail and unsupervised, restricted access (i.e., with a permit) along a fenced southern skyline ridge trail (proposed access program)

The access program variants incorporate the first three items identified above for the project but would differ from the project with regard to watershed access and associated security measures. As discussed more fully in Section 2.7.1, Trail Access Management Program and Visitation, the variants present three modified access scenarios, including:

- Supervised access, similar to the existing docent program, along an unfenced Fifield-Cahill ridge trail and/or unfenced southern skyline ridge trail (access program variant 1)
- Unsupervised and unrestricted access along a fenced Fifield-Cahill ridge trail and/or fenced southern skyline ridge trail (access program variant 2)

[1] S.R. 35 is also Skyline Boulevard in this location.

- Unsupervised and restricted (i.e., with a permit) access along a fenced Fifield-Cahill ridge trail and/or fenced southern skyline ridge trail (access program variant 3)

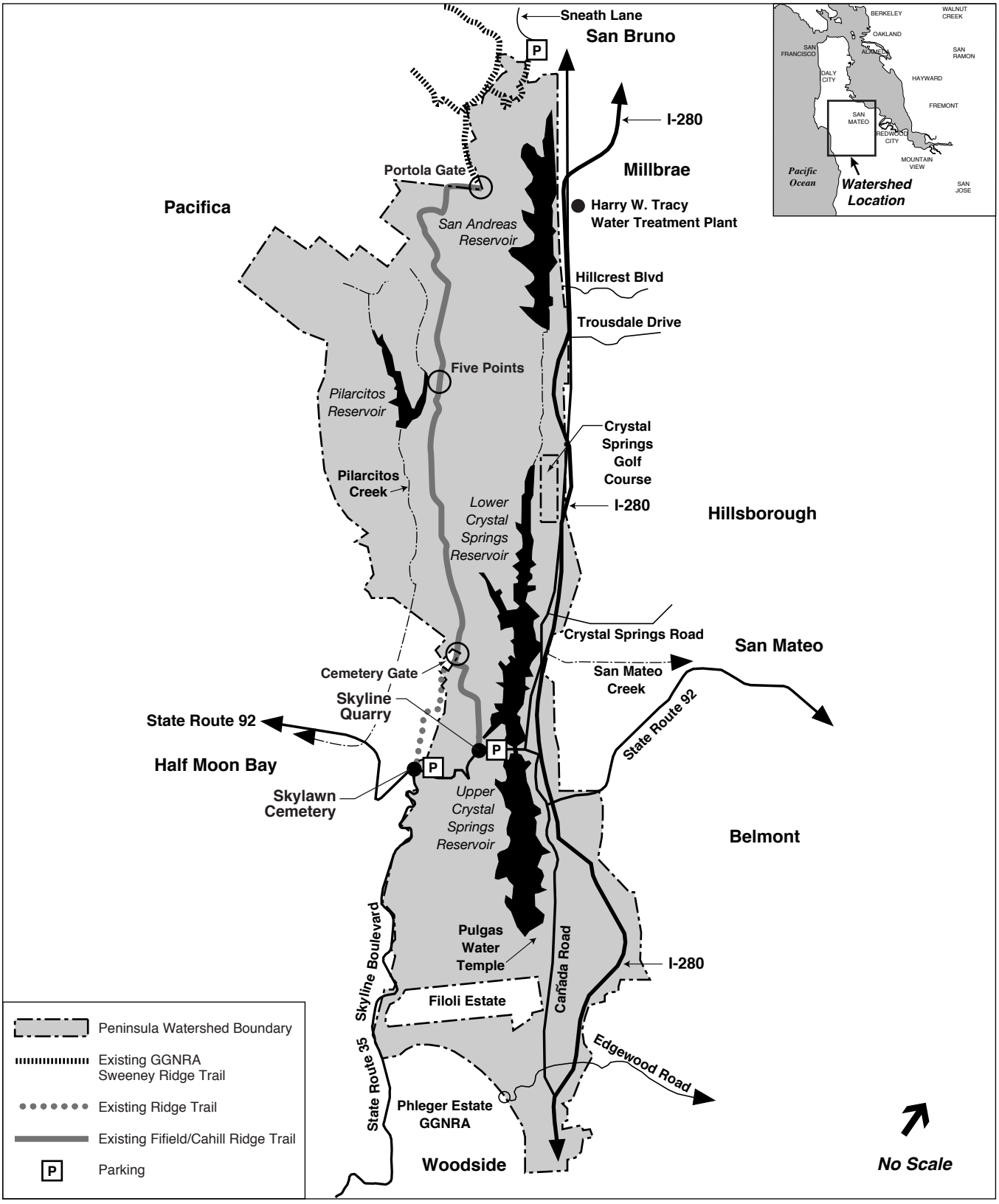
2.2 Background

The mission of the SFPUC is to serve its San Francisco and Bay Area customers with reliable, high-quality, and affordable water and wastewater treatment while maximizing benefits from power operations and responsibly managing the resources—human, physical, and natural—entrusted into its care. Among the resources the SFPUC is charged with managing are protected watershed lands extending from the Sierra Nevada mountains in the east to the San Francisco Peninsula in the west. The latter includes the Peninsula Watershed, which encompasses 23,000 acres in San Mateo County (Figure 2-1). The Peninsula Watershed contains four reservoirs that store water derived from both the Sierra Nevada mountains and local runoff. As these lands have been managed for drinking water collection and storage for nearly a century, they remain largely undeveloped and support a diversity of natural resources. The Peninsula Watershed is designated as a Fish and Game Refuge by the California Department of Fish and Wildlife. In addition, the lands are subject to scenic and recreation easements administered by the Golden Gate National Recreation Area (GGNRA). The Peninsula Watershed is also part of the protected areas in the Golden Gate Biosphere, which is one of over 650 sites within the United Nations Educational, Scientific, and Cultural Organization's World Network of Biosphere Reserves.

The SFPUC developed the Peninsula Watershed Management Plan[2] to address the management of watershed lands in a comprehensive, integrated manner. The purpose of the management plan is to provide a policy framework for decisions about activities, practices, and procedures affecting the Peninsula Watershed. This framework consists of a collection of goals, policies, and management actions that address both long-term management objectives and day-to-day operations and maintenance activities. The management plan provides SFPUC staff with direction across a broad range of Peninsula Watershed resources and issues, including but not limited to, water quality, water supply, ecological and cultural resources, and fire safety. In addition, the management plan includes specific policies and management actions in response to the Bay Area Ridge Trail Council's request that the Bay Area Ridge Trail be routed through a portion of the Peninsula Watershed. The SFPUC's construction and management of Bay Area Ridge Trail segments and associated facilities—which would extend and enhance the Bay Area Ridge Trail on the Peninsula Watershed—are the focus of this EIR.

The Peninsula Watershed Management Plan includes alignment and access management variants (or "alternatives" as described in that document) for two segments of trail across the Peninsula Watershed, referred to in this EIR as the Fifield-Cahill ridge trail and the southern skyline ridge trail. As described in the management plan, the first trail segment (Fifield-Cahill ridge trail) was envisioned as generally extending from GGNRA's Sweeney Ridge Trail south through the watershed along the Fifield-Cahill service road to the intersection of S.R. 92/S.R. 35 (or alternatively to Skyline Quarry). The plan identifies access management program alternatives for

[2] San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018.



Southern Skyline Boulevard Ridge Trail Extension

SOURCE: EDAW, Inc., 1998; ESA

Figure 2-1

Peninsula Watershed Existing Conditions

the Fifield-Cahill ridge trail ranging from unrestricted access to docent-led access (management plan trail alternatives A through D). The second trail segment (the southern skyline ridge trail) was envisioned as continuing south from the S.R. 92/S.R. 35 intersection along S.R. 35 or across SFPUC and/or private property to a point of connection with a trail leading to Kings Mountain (management plan trail alternative A/B). The management plan envisions unrestricted public access for the southern skyline ridge trail segment.

The management plan envisions implementation of the Fifield-Cahill ridge trail alternatives within five years of plan adoption. In anticipation of near-term implementation, and because the alignments were fairly well established (i.e., they mainly followed established roadways), the management plan describes the Fifield-Cahill ridge trail alternatives at a project level of detail (i.e., a high degree of detail). The plan envisions as-needed implementation of the southern skyline ridge trail alternative, or as staffing and funding allowed. Because the southern skyline ridge trail alignment required additional and costlier site investigation and analysis to determine the optimal alignment, the plan describes it at a program level of detail (i.e., a conceptual level of detail). The alignment alternatives presented in the management plan, which address both Fifield-Cahill ridge trail and the southern skyline ridge trail, are described as follows:

- **Peninsula Watershed Management Plan Alternative A (Phase 1): Unrestricted Access with Termination at S.R. 92/Skyline Boulevard.** Under this alternative, identified as action tra1a, the trail would extend along the Fifield-Cahill service road between Portola Gate and the S.R. 92/S.R. 35 intersection. The trail improvements would include five new restrooms and parking near the S.R. 92/S.R. 35 intersection, and the trail would be open to unrestricted, multi-modal public access.
- **Peninsula Watershed Management Plan Alternative B (Phase 1): Unrestricted Access with Termination at Skyline Quarry.** Under this alternative, identified as action tra1b, the trail would extend along the Fifield-Cahill service road between Portola Gate and Skyline Quarry. The trail improvements would include five new restrooms and parking at Skyline Quarry, and the trail would be open to unrestricted, multi-modal public access.
- **Peninsula Watershed Management Plan Alternative C (Phase 1): Access by Annual Permit with Termination at Skyline Quarry.** Under this alternative, identified as action tra1c, the trail would extend along the Fifield-Cahill service road between Sneath Lane and Skyline Quarry. The trail improvements would include five new restrooms and parking at Skyline Quarry, and trail would be open to restricted (i.e., with a permit), multi-modal public access.
- **Peninsula Watershed Management Plan Alternative D (Phase 1): Docent Led Access with Termination at Skyline Quarry.** Under this alternative, identified as action tra1d, the trail would extend along the Fifield-Cahill service road between Sneath Lane and Skyline Quarry. The trail improvements would include five new restrooms and parking at Skyline Quarry, and the trail would be open to restricted (i.e., docent-led), multi-modal public access.
- **Peninsula Watershed Management Plan Alternative A/B (Phase A): Unrestricted Access along Programmatic Skyline Boulevard Alignment.** Under this alternative, identified as action tra2, the trail described in alternative A (action tra1a) would continue south from the S.R. 92/S.R. 35 intersection approximately 4.6 miles to a point of connection with the Kings Mountain Trail. The alignment would either follow S.R. 35 or require construction of a new trail on SFPUC property and/or private property adjacent to S.R. 35. As with alternative A (action tra1a), public access for hikers, bikers, and equestrians would be unrestricted from

8 a.m. to dusk, seven days per week, all year long. Support facilities identified for this alternative include a parking/staging area, restrooms, and horse watering troughs, among other amenities. Similar to alternatives A through C, this alternative would require fire management actions and call for rangers and volunteers to patrol the trail alignment. The management plan also describes a scenario under which alternative A/B (action tra2) would be constructed in combination with alternative B (action tra1b), requiring a trail connection between the alternative B termination point at Skyline Quarry and the alternative A/B trailhead at the S.R. 92/S.R. 35 intersection.

The San Francisco Planning Department prepared an EIR evaluating the physical effects of the management plan on the environment.[3] The management plan is primarily a policy document the SFPUC uses to guide development of specific management actions and projects. The management plan describes the Fifield-Cahill ridge trail at a greater level of detail than other proposed actions; therefore, the EIR analyzes management plan alternatives A through D (actions tra1a through tra1d) at a project level of detail, and addresses the southern skyline ridge trail at a program level of detail. Based on the analysis in the management plan EIR, the planning department identified alternative D (action tra1d, docent-led access with termination at Skyline Quarry) as the environmentally superior trail alternative.

On January 11, 2001, the San Francisco Planning Commission certified the Peninsula Watershed Management Plan Final EIR.[4] On June 26, 2001, the SFPUC adopted the Peninsula Watershed Management Plan and associated California Environmental Quality Act (CEQA) findings and a mitigation monitoring and reporting program.[5] After certification of the management plan EIR and adoption of the management plan, members of the community proposed a fifth Fifield-Cahill ridge trail alternative, known as alternative E (guided multi-modal access). The San Francisco Planning Department examined the new Fifield-Cahill ridge trail alternative, which was not specifically described in the management plan EIR, and determined that alternative E (action tra1e) fell within the range of trail alternatives analyzed in the EIR and was similar to management plan alternative D (docent-led access), whose mitigation measures would apply to alternative E. The department therefore determined that the EIR adequately analyzed the environmental effects of alternative E. The SFPUC adopted alternative E as the trail access for the Fifield-Cahill ridge trail and amended and finalized the management plan on December 18, 2002.[6] The alternative E alignment presented in the amended management plan is described as follows:

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3 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

4 San Francisco Public Utilities Commission, Peninsula Watershed Management Plan, Spring 2002, https://sfwater.org/modules/showdocument.aspx?documentid=756, accessed May 18, 2018, p. 9-4.

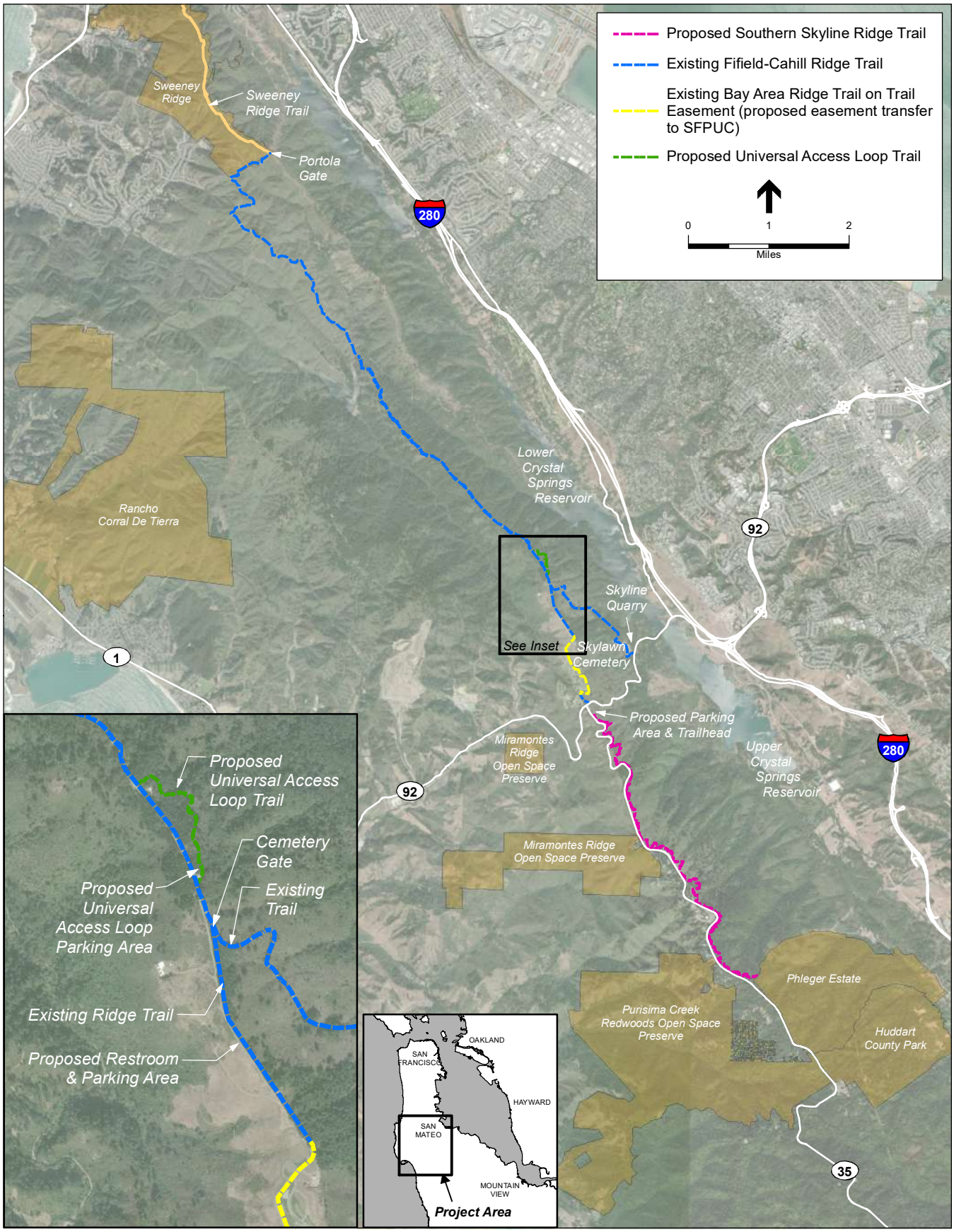
5 San Francisco Public Utilities Commission, Resolution No. 01-0140: Adopting California Environmental Quality Act Findings and the Mitigation Monitoring and Reporting Program and adopting and finalizing the Peninsula Watershed Management Plan, *Peninsula Watershed Management Plan*, Spring 2002, p. 9-1.

6 San Francisco Public Utilities Commission, Resolution No. 02-0265: Adopting California Environmental Quality Act Findings and Mitigation Monitoring and Reporting Program, Adopting Fifield/Cahill Ridge Trail Alternative E, and Amending and Finalizing the Peninsula Watershed Management Plan, *Peninsula Watershed Management Plan*, Spring 2002, pp. 10-1 to 10-3.

- **Peninsula Watershed Management Plan Alternative E (Phase 1): Guided Multi-modal Access with Termination at both Skyline Quarry and S.R. 92/Skyline Boulevard.** Under this alternative, identified as action tra1e, the trail would extend along the Fifield-Cahill service road, between Sneath Lane and both Skyline Quarry and S.R. 92/S.R. 35 via Skylawn Memorial Park. With a scheduled, supervised group (up to 20 people per group, three groups per day), hikers, bicyclists, and equestrians would be allowed to use the trail from 8 a.m. to dusk, three days per week, all year long. Unauthorized persons (i.e., those without a reservation) would be prohibited. The number of users per day would be limited to 60. Primary parking for Alternative E would be located at Skyline Quarry; limited parking would also be available on SFPUC property near Cemetery Gate. Five permanent restrooms would be located along the trail. Informational, directional, and regulatory signage would be installed, along with access barriers to intersecting trails/roads. Americans with Disabilities Act accessibility improvements would be made as needed. A moderate water quality and ecological resource monitoring program would be developed and implemented.

In keeping with the management plan's vision of implementing phase 1 projects within five years of the plan's adoption, the alternative E improvements were constructed and docent-guided tours began in 2003. As constructed, the Fifield-Cahill ridge trail extends approximately 10 miles, from the Portola Gate at Sweeney Ridge to Skyline Quarry near S.R. 92 (Figure 2-2). As envisioned in the management plan, the trail is accessible to small groups of hikers, bicyclists, or equestrians (up to three groups of 20 people; fewer on horseback) up to three days per week with a reservation and a trained docent or volunteer trail leader. Primary access from the north is via the western terminus of Sneath Lane, west of S.R. 35, and from the south via Skyline Quarry, north of S.R. 92. At Sneath Lane, near the Sweeney Ridge trailhead, semiformal and informal roadside and shoulder parking can accommodate approximately 25 vehicles. There is an informal dirt parking lot at the southern terminus of the Fifield-Cahill ridge trail in the former Skyline Quarry that can accommodate approximately 160 vehicles. Trail users with disabilities may also access the trail at Cemetery Gate via a paved road through Skylawn Memorial Park. Trail amenities include five toilets, spaced at approximately 2-mile intervals between Portola Gate and Skyline Quarry. No potable water is provided along the trail.

Similarly, consistent with the management plan's intent to implement phase A projects on an as-needed basis, or as staff time and funding allowed, the SFPUC has since identified a number of funding opportunities that would allow implementation of alternative A/B (action tra2, unsupervised access along programmatic southern skyline ridge trail alignment). Thus, the project-specific details of the southern skyline ridge trail, including the proposed location, construction, and operation, have advanced from a program to a project level of detail. In addition, the SFPUC has identified and proposes to implement a number of access improvements for the Fifield-Cahill ridge trail. In combination with the proposed southern skyline ridge trail and Fifield-Cahill ridge trail improvements, the SFPUC is considering revisions to the access management program that could apply to both existing and proposed facilities. The proposed access program and variants—which include these trail extensions and access improvements—are the subject of this EIR.



SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 2-2

Project Overview and Regional Setting

2.3 Project Location

As shown in Figure 2-1, the 23,000-acre Peninsula Watershed is located in central San Mateo County, south of San Francisco. The City and County of San Francisco owns virtually the entire hydrologic watershed, which is under the jurisdiction of the SFPUC. The watershed includes the San Andreas and Crystal Springs (Upper and Lower) reservoirs, which are adjacent to I-280, and the Pilarcitos Reservoir to the west. S.R. 92 bisects the watershed and passes between the Upper and Lower Crystal Springs reservoirs. From its intersection with S.R. 92, S.R. 35 extends toward the south, forming the watershed's approximate western boundary between S.R. 92 and the Phleger Estate.[7] There are several internal maintenance and fire roads within the watershed. Some of these roads come together in the northern portion of the watershed near Mud Dam at a site along the Fifield-Cahill ridge trail known as Five Points (Figure 2-1).

The predominant land uses near the watershed include residential developments and I-280 to the north and east, and the mostly undeveloped wooded Santa Cruz Mountains to the west and south. There are several recreational trails on public lands in the vicinity of the watershed, including the Sweeney Ridge Trail to the north, Crystal Springs Regional Trail to the east, Rancho Corral de Tierra to the west, and Purisima Creek Redwoods Open Space Preserve and the Phleger Estate to the south, among others. Figure 2-2 shows the project area, which includes watershed lands north and south of S.R. 92, and other notable nearby public lands.

The portion of the project area south of S.R. 92 extends south from S.R. 92 approximately 6 miles to the Phleger Estate boundary and east from S.R. 35 up to several hundred feet. This portion of the project area includes the east-facing slopes of Skyline Ridge, with patches of northern coastal scrub and Douglas fir forest in the north; a broad, vegetated fuelbreak in the middle; and mature stands of mixed evergreen and redwood forests in the south. Development in this area includes the California Department of Transportation (Caltrans) vista point parking lot, S.R. 35, an unpaved roadbed, intermittent segments of barbed-wire perimeter fencing and access gates, overhead utility lines, and a small number of private residences.

The portion of the project area north of S.R. 92 includes the segment of the Fifield-Cahill ridge trail from Portola Gate in the north to Cemetery Gate in the south, as well as the existing ridge trail segments extending farther south from Cemetery Gate to Skyline Quarry in the east and to the S.R.92/S.R. 35 intersection in the west. All project staging and construction activities would occur in this area, which is generally composed of rolling ridgeline hills, open meadows, dense stands of northern coastal scrub, and Douglas fir forest. Development in this portion of the project area includes existing paved and unpaved roads, gates and various fencing (e.g., chain link and split rail) in limited locations, restrooms and other small utility structures (e.g., water tanks and enclosures), and the landscaped grounds of the Skylawn Memorial Park and appurtenant facilities.

7 The Phleger Estate is the property of the Golden Gate National Recreation Area.

2.4 Project Goals and Objectives

2.4.1 Relationship to Peninsula Watershed Management Plan Goals

As described in Section 2.2, Background, the project is part of the SFPUC's Peninsula Watershed Management Plan. The management plan identifies primary and secondary goals for the watershed, which form the basis for the plan's policies and actions. This section presents the plan's primary and secondary goals. Chapters 4 and 5 of the management plan present the associated policies and actions. Because the project is a management plan action proposed for the watershed, the plan's goals and policies also apply to the project.

2.4.1.1 Peninsula Watershed Management Plan Primary Goal

The primary goal of the plan is to maintain and improve source water quality to protect public health and safety.

2.4.1.2 Peninsula Watershed Management Plan Secondary Goals

The secondary goals of the plan are to:

- Maximize water supply
- Preserve and enhance the ecological and cultural resources of the watershed
- Protect the watersheds, adjacent urban areas, and the public from fire and other hazards
- Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, and scientific uses
- Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits, and an administrative framework that allows implementation of the Peninsula Watershed Management Plan
- Enhance public awareness of water quality, water supply, conservation, and watershed protection issues

The proposed trail extension project aims to expand opportunities for educational, recreational, and scientific uses on watershed lands. These expanded opportunities are intended to facilitate increased public awareness of water quality, water supply, conservation, and watershed protection issues. The SFPUC seeks to enable such access while continuing to preserve and enhance the watershed's natural and cultural resources, and to minimize hazards and risks through the project's proposed access management and security provisions.

2.4.2 Project Objectives

The primary objectives of the project are to:

- Enhance public awareness of water quality, water supply, ecological, and watershed protection issues by providing compatible recreational opportunities in the Peninsula Watershed

- Provide opportunities to educate the general public about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including its unique and diverse habitats
- Extend the Bay Area Ridge Trail south from S.R. 92 to the GGNRA's Phleger Estate
- Improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities
- Support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay

2.5 Project Components

The primary project components include trail improvements and expansions, new visitor amenities, a public access easement transfer, and trail access program modifications and associated security measures. These elements of the project are summarized below. Figures 2-3a through 2-3e and Figure 2-4 show the general locations and extent of project elements. The subsections below describe project construction and operation.

2.5.1 Trail Improvements and Expansions

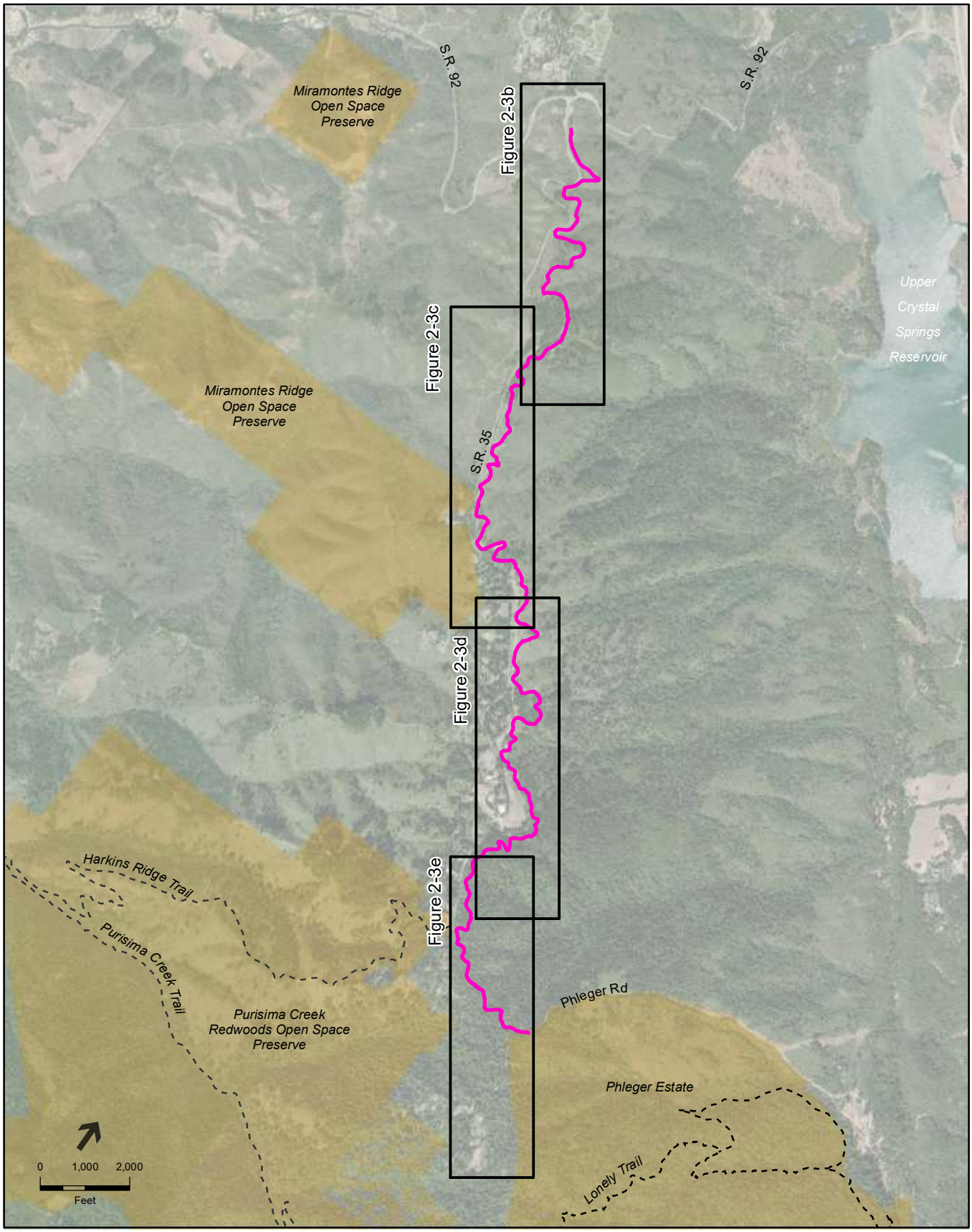
This subsection presents the subject trail improvements and expansions by geography. Trail improvements associated with the southern skyline ridge trail (south of S.R. 92) are grouped together, as are those associated with the Fifield-Cahill ridge trail (north of S.R. 92).

2.5.1.1 Southern Skyline Boulevard Ridge Trail Extension

The project's main component—the southern skyline ridge trail—would be located at the top of Skyline Ridge, 1 to 1.75 miles upslope and to the west of Upper Crystal Springs Reservoir. The trail would extend south for approximately 6 miles, generally following S.R. 35 from S.R. 92 to the southern boundary of the SFPUC property at the GGNRA's Phleger Estate. Until a trail connects the southern skyline ridge trail to the existing Lonely Trail near the Kings Mountain Fire Brigade on the GGNRA side of the property boundary (see Figure 2-3a), southern skyline ridge trail users would be required to turn around at the watershed boundary and return via the same path.

The proposed trail alignment traverses varied landscapes—from scrub-covered ridges in the north, through broad *rolling bench*[8] and *vegetated fuelbreak*[9] along its middle, to rugged and densely forested slopes in the south. The SFPUC identified the proposed route based on the trail design requirement to maintain a maximum 10 percent slope along the length of the trail, to follow the existing grades and topography, and to minimize the removal of existing trees. At its northern terminus (near the intersection of S.R. 92 and S.R. 35), the SFPUC would construct a new trailhead parking lot, information kiosk, and pedestrian gate near the existing Caltrans vista point and parking lot (Figure 2-3b). A portion of the trail would follow an existing roadbed that is periodically used for watershed management and maintenance activities.

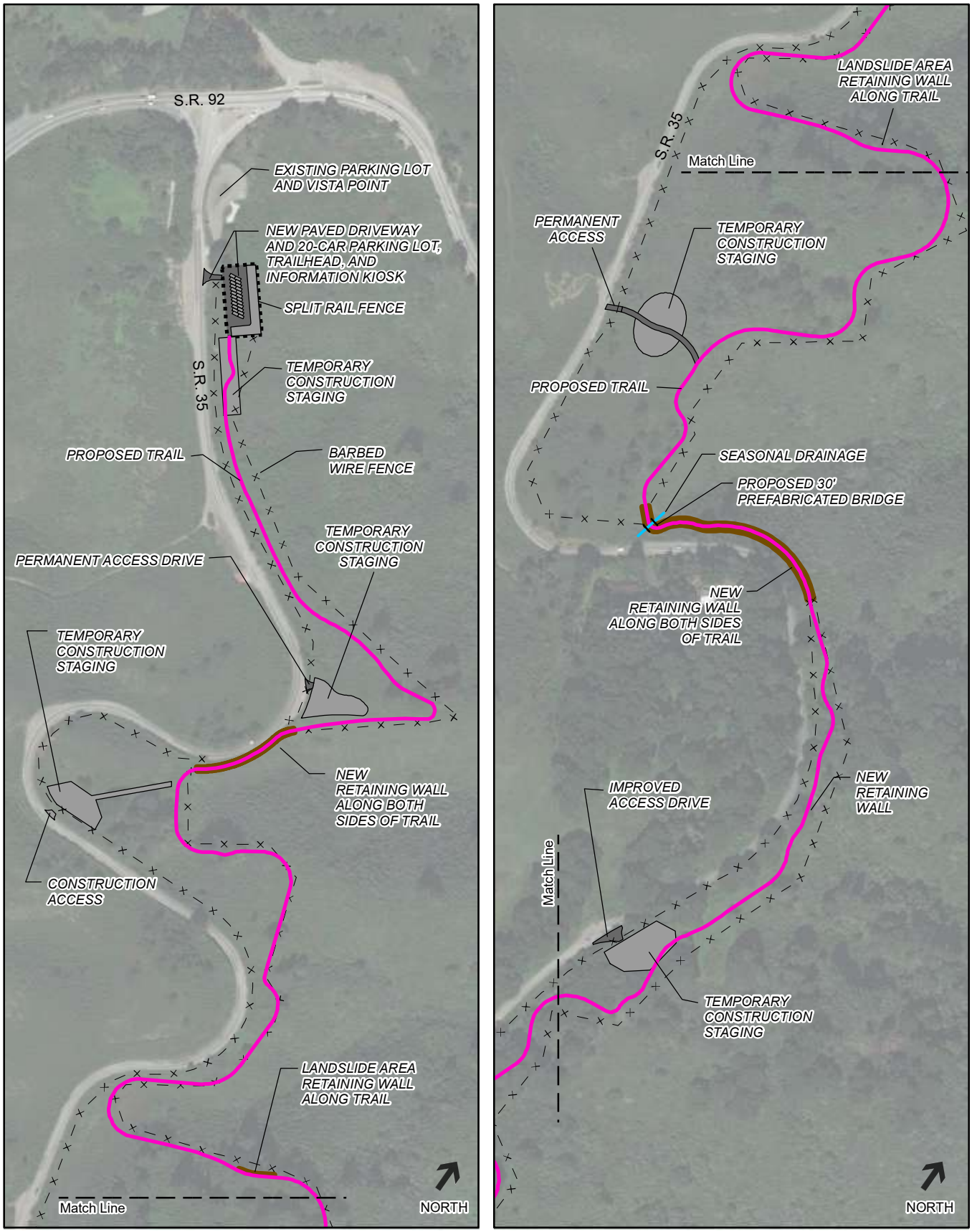
[8] A rolling bench is a strip of gently sloping land that is bounded by distinctly steeper slopes above or below.
[9] A vegetated fuelbreak is a strip of land that has been cleared of dense vegetation and replanted with grasses or forbs to enable firefighter access and prevent the spread of wildfire.



SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 2-3a
Index Map



SOURCE: ESRI; ESA

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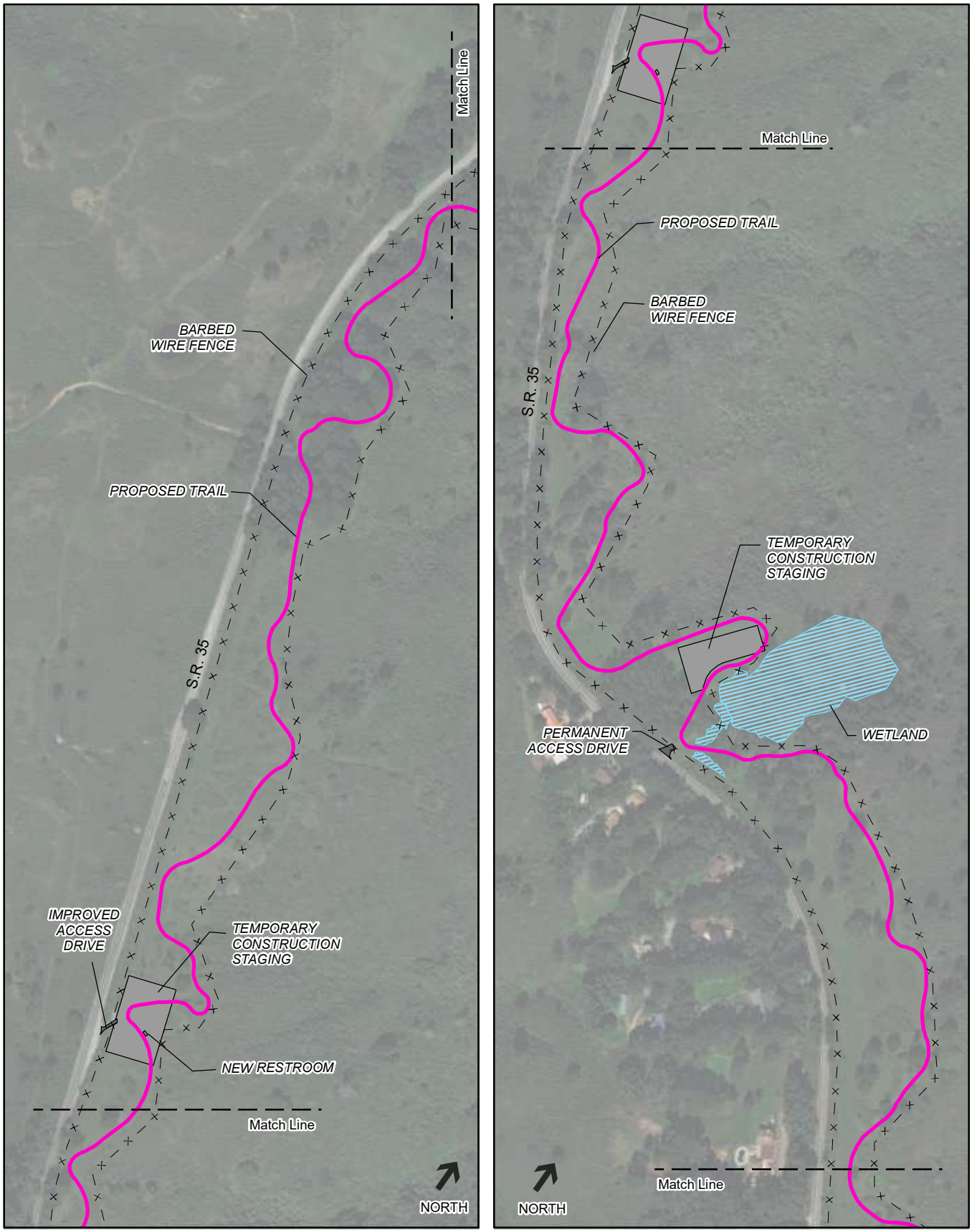
Feet

Southern Skyline Boulevard Ridge Trail Extension

Figure 2-3b
Proposed Southern Skyline Boulevard Ridge Trail



SOURCE: ESRI; ESA

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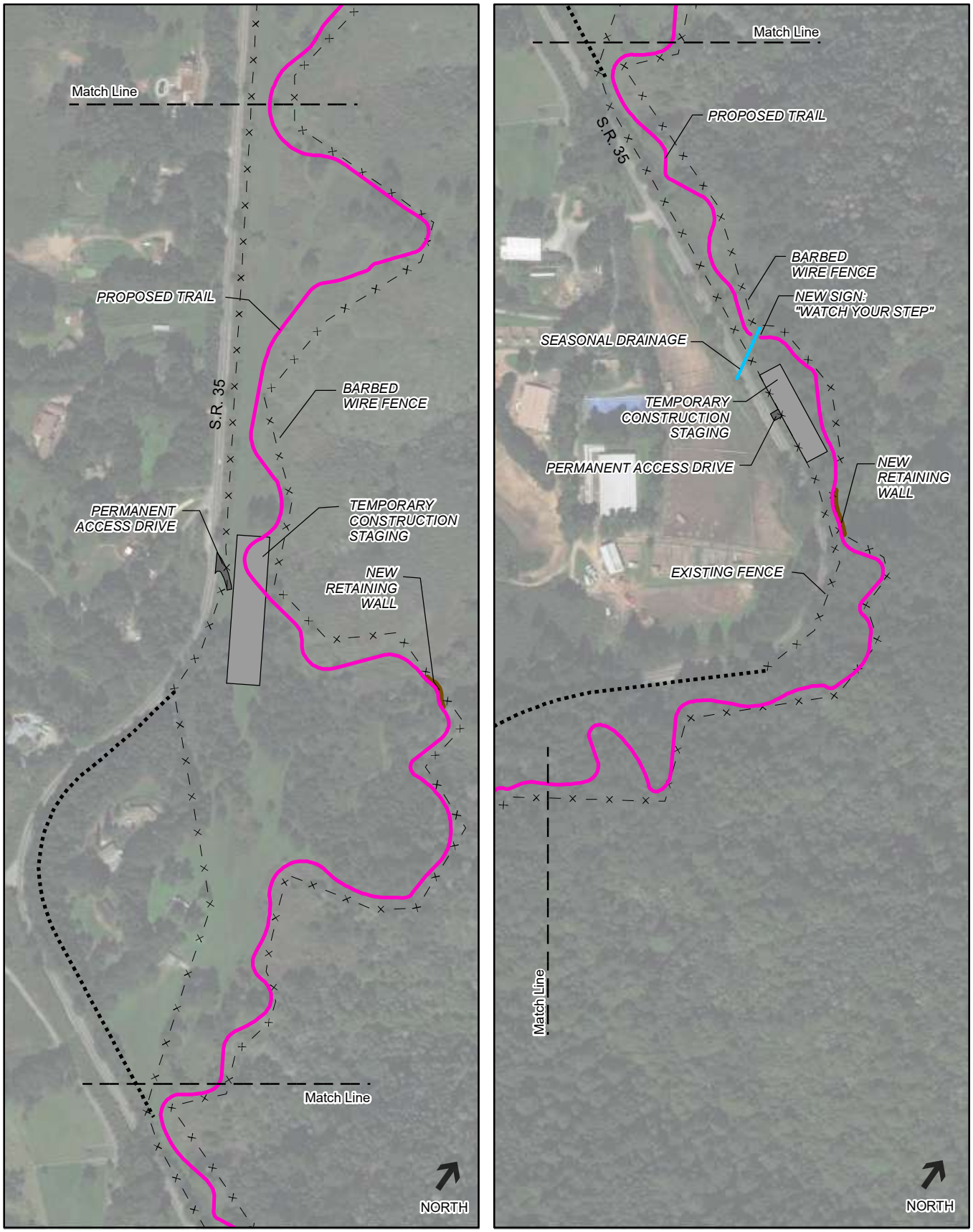
Southern Skyline Boulevard Ridge Trail Extension

Figure 2-3c
Proposed Southern Skyline Boulevard Ridge Trail



SOURCE: ESRI; ESA

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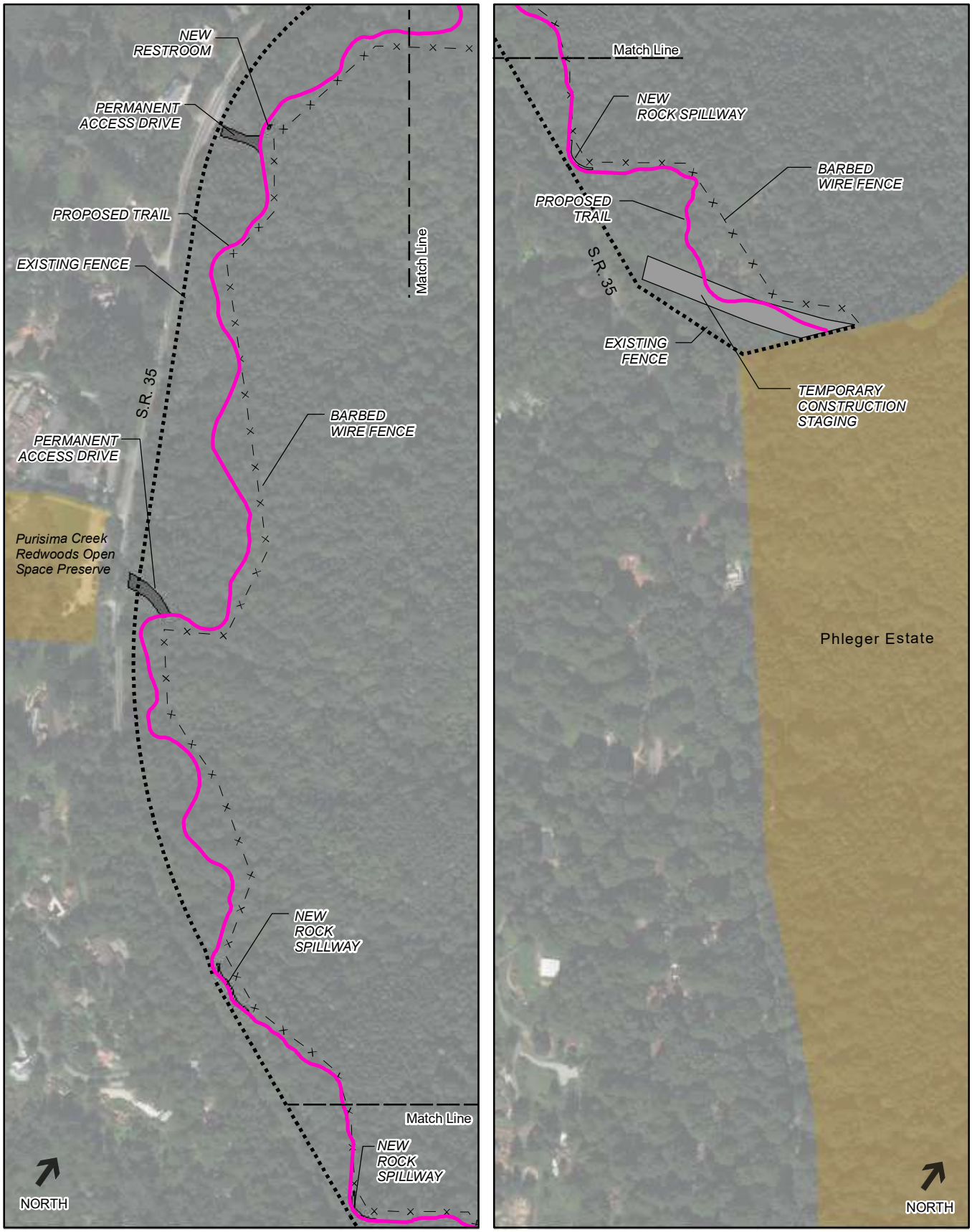
Southern Skyline Boulevard Ridge Trail Extension

Figure 2-3d
Proposed Southern Skyline Boulevard Ridge Trail



SOURCE: ESRI; ESA

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Feet

Southern Skyline Boulevard Ridge Trail Extension

Figure 2-3e

Proposed Southern Skyline Boulevard Ridge Trail

Along the steeper segments of trail, the SFPUC would install retaining walls to facilitate trail construction and stabilize the slope and would construct access drives (i.e., formalized driveway segments linking S.R. 35 with lockable gates for use by authorized personnel) at various points along the southern skyline ridge trail. Along the segment of trail across S.R. 35 from the Purisima Creek Redwoods Preserve north parking lot, the SFPUC would construct a new trail accessway with a lockable gate to facilitate potential future access between the preserve and the southern skyline ridge trail.[10] In addition, along the middle and southern segments of the trail, the SFPUC would install two permanent *vault toilets*.[11] Figures 2-3a through 2-3e present an overview of the southern skyline ridge trail and associated facilities.

The proposed trail would generally be 6 feet wide. The trail would consist of an aggregate (rock) base, some of which might be sealed with a natural resin. Within sloped areas of the trail alignment, the trail surface would be constructed with a 2 percent cross-slope to route water away from the slope. Along the flatter sections of trail, the trail surface would be constructed with a 1 percent cross-slope toward both sides to route water away from the trail center. The SFPUC also proposes two permanent rock spillways, measuring 1,250 square feet and 750 square feet, at separate locations near the trail's southern terminus to capture trail surface runoff (see Figure 2-3e).

Visitor Access and Parking

As proposed, the project calls for construction of an approximately 1,750-square-foot driveway and 22,600-square-foot parking lot accommodating up to 20 vehicles, along with additional parking for four horse trailers, near the intersection of S.R. 92 and S.R. 35, just south of and adjacent to the existing Caltrans vista point parking area. The parking lot would be designed in coordination with Caltrans and would adhere to the SFPUC Engineering Management Bureau's design guidelines. The lot would be paved and would drain to adjacent vegetated areas. Wildlife-proof trash cans would be installed for visitor use. Figure 2-3b shows the location of the proposed southern skyline ridge trail parking lot. As indicated in the figure, the parking lot's driveway would front S.R. 35.

Operational Access Drives

In addition to the main driveway and parking lot, the SFPUC would construct five new, and improve four existing, permanent access drives between S.R. 35 and the southern skyline ridge trail. These access drives would be constructed to facilitate access by SFPUC staff, contractors, and other authorized personnel to project staging areas during construction. All but one would remain in place after construction for official maintenance, operations, emergency response, and routine patrol activities. The proposed access drives would be constructed of aggregate base material and span approximately 14,500 square feet. Figures 2-3b through 2-3e show the locations of these permanent access drives.

[10] The project does not propose a crossing of S.R. 35. The SFPUC would work with the Midpeninsula Regional Open Space District regarding any future crossing.

[11] Self-contained restroom unit, typically meant for one person's use at a time, in which waste is deposited into a vault, or tank, that must be periodically emptied or cleaned.

Restroom Facilities

The SFPUC would install two permanent, prefabricated restrooms along the southern skyline ridge trail, each having containment vaults with a capacity of approximately 15,000 uses. The structures would be approximately 12 feet tall. The design and construction of the restrooms would conform with the Unified Federal Accessibility Standards, Americans with Disabilities Act, and California's Title 24 requirements.[12] The restroom design and surface treatments would appear similar to those of other restrooms along the Fifield-Cahill ridge trail and would be subject to the City and County of San Francisco's Civic Design Review process. Accordingly, as with the existing restroom facilities along the Fifield-Cahill ridge trail, the proposed restroom structures would be comprised primarily of wood and concrete, with non-reflective, earthen-toned surfaces and finishes, and one to two small, rectangular, low-glare windows or non-reflective screened openings for light and ventilation. Each restroom would be equipped with a wildlife-proof trash can. Figures 2-3c and 2-3e show the approximate locations of these facilities.

Retaining Walls and Bridge

The project would require retaining walls at four locations along the northern extent of the proposed southern skyline ridge trail, and at two locations near the middle of the proposed trail (see Figures 2-3b and 2-3d). These retaining walls would be necessary to stabilize slopes and establish a terrace for building trail segments along steep, sloped areas of the trail alignment. The retaining systems proposed for locations along the northern stretch of trail would be constructed of *soldier piles* with wood or concrete *lagging*.[13] The retaining walls along the middle stretch of trail would consist of unreinforced concrete blocks or log *crib wall*.[14] The proposed retaining walls, segments of which would be installed along both sides of the trail, would total approximately 2,850 linear feet. The SFPUC would install drain pipes in the lagging to allow water to pass through the walls. In some areas, workers might construct rock *spillways*[15] or dissipation areas at the drain pipe outfall locations.

The project calls for installation of a prefabricated bridge along a segment of the southern skyline ridge trail approximately 1.25 miles south of the proposed trailhead and parking area. At this location, shown in Figure 2-3b, the trail alignment intersects a gully and seasonal drainage. The SFPUC would construct the trail to within approximately 10 feet of the gully and install a 30-foot-long, 6-foot-wide prefabricated bridge with a metal frame and wooden decking to allow for passage over the gully. The bridge design would meet performance specifications for pedestrian/equestrian loading and structural support, which would be determined based on a geotechnical analysis. The prefabricated bridge would have four piers on each side, covered with pile caps.

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12 Title 24 of the California Code of Regulations is also known as the Energy Efficiency Standards for Residential and Nonresidential Buildings.

13 A retaining wall system that uses H-shaped steel beams, also known as piles, for vertical support. The piles are drilled deep into the earth at regular intervals. Wood or concrete panels, known as lagging, are then installed between the piles to provide horizontal support.

14 A gravity retaining wall constructed by stacking elements (e.g., logs or concrete blocks) in an interlocking fashion, which creates a series of hollow cells that are backfilled with rock or soil.

15 A structure used to control the rate of flow along a channel.

Security Features

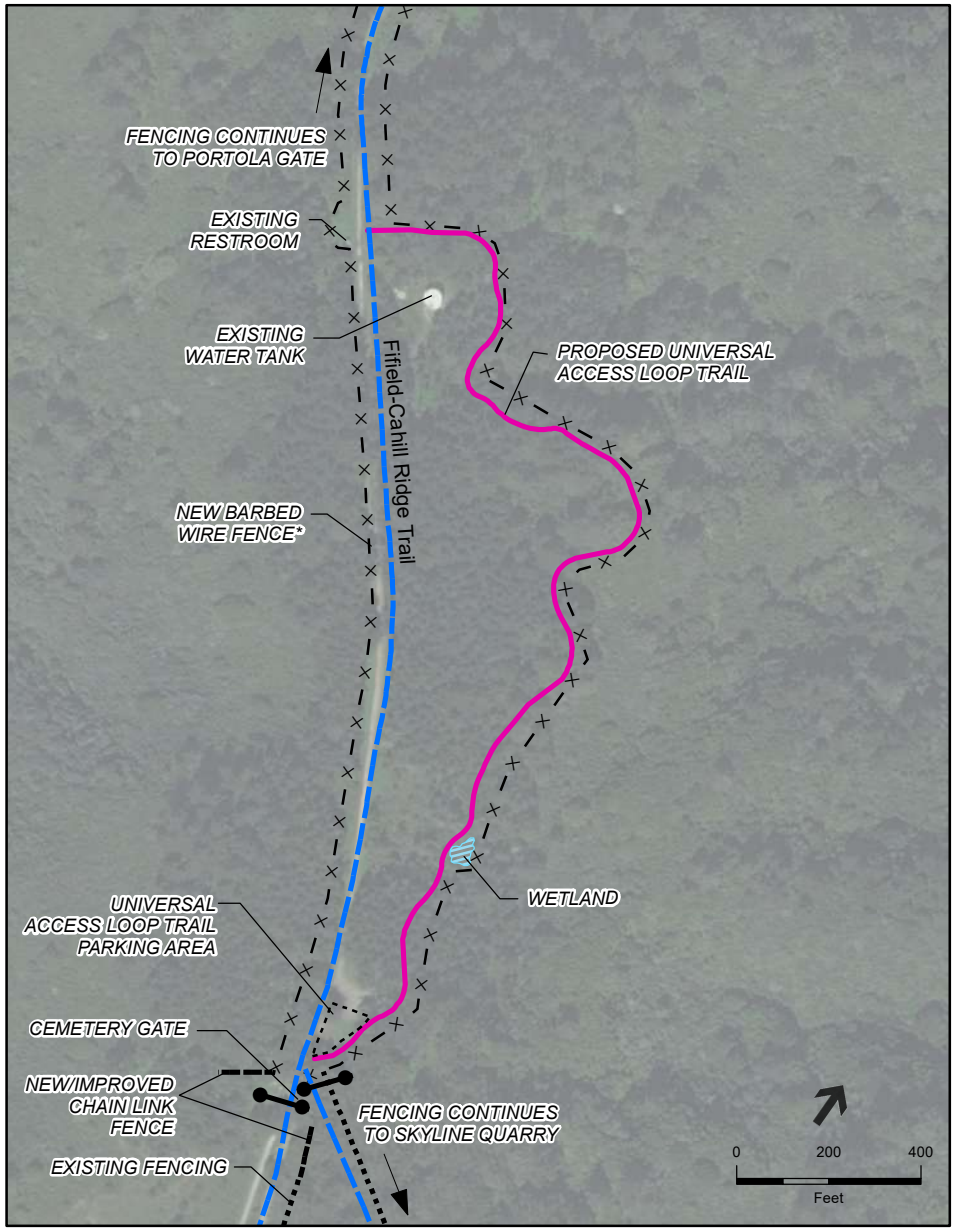
To facilitate public access through the watershed while minimizing risks to public health and safety, the SFPUC would repair or install perimeter fencing along most of the southern skyline ridge trail alignment, with lockable gates at designated access points. This fencing would mainly be 5-foot-tall, barbed-wire fence along approximately 5.5 miles of the trail's eastern frontage and 3.6 miles of the trail's western frontage. The barbed-wire fencing would be strung between metal posts spaced approximately 10 feet apart. The SFPUC is considering a range of barbed-wire fencing types, with heights ranging from 42 to 60 inches, strands ranging from five to seven, and with un-barbed bottom wires ranging from 12 to 18 inches above the ground surface. The SFPUC is not proposing new fencing where barbed-wire fencing already exists in the remaining portions of the western frontage. The project design calls for barbed-wire fencing setbacks of approximately 5 to 850 feet from the trail centerline. The SFPUC would install approximately 1,380 linear feet of 2.5-foot-tall barrier rail along the outer slope edge of trail segments with retaining walls. In addition, the SFPUC would construct a 4-foot-tall, 610-foot-long split-rail fence along the perimeter of the southern skyline ridge trail parking lot.

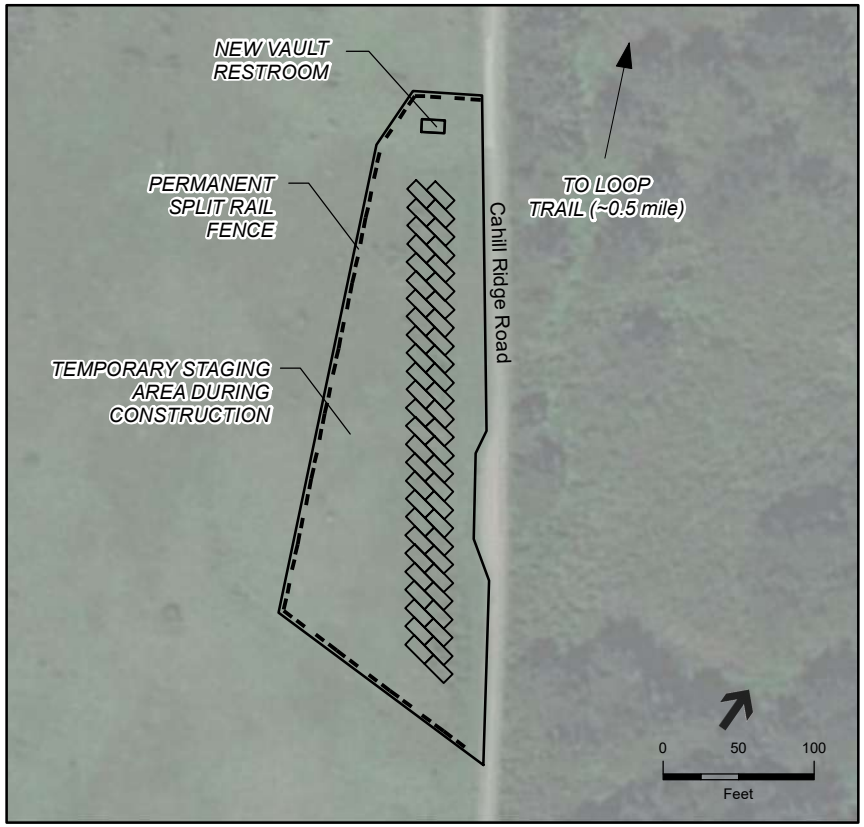
At each access point, and at 0.5-mile intervals along the perimeter fencing on both sides of the trail, the SFPUC would install lockable gates for maintenance access. Each gate would be bounded on either side by the above-described barbed-wire fence, with the exception of the existing accessway opposite S.R. 35 from Misty Ridge Road, which would be bounded on both sides by 150 feet of new 6-foot-tall chain-link fence. For safety and security reasons, the type and extent of fencing proposed for the southern skyline ridge trail is generally the same for the project and the variants. However, under the proposed access program and variants 2 and 3 (unsupervised access), the SFPUC would install one-way pedestrian gates (e.g., turnstiles) at each trailhead to enable egress after the access gates have been locked at the end of each day. None of the project components proposed for the southern skyline ridge trail would include nighttime lighting.

2.5.1.2 Fifield-Cahill Ridge Trail Improvements

Universal Access Loop Trail

North of Cemetery Gate, the SFPUC would construct a new trailhead and a universal access loop trail that would comply with the Americans with Disabilities Act, including a surface that would be useable in all weather conditions (e.g., remains stable, firm, and slip resistant during rainy conditions). Proposed trailhead amenities include an educational/interpretive kiosk and directional signage. The loop trail, which could be accessed from the Fifield-Cahill ridge trail at the Cemetery Gate kiosk, would wind its way along a gentle grade in a northeasterly direction through the Douglas fir forest to a second point of connection with the Fifield-Cahill ridge trail. The SFPUC would construct the approximately 0.5-mile-long, 10-foot-wide trail segment using native material on compacted structural fill and sealed with a resin surface. The slopes and surfaces of the trail would be consistent with Americans with Disabilities Act specifications. Trail drainage would be as described above for the southern skyline ridge trail. Figure 2-4 shows the approximate location of the proposed loop trail.





* Barbed wire fencing would be installed only under variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access)

SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 2-4

Proposed Fifield-Cahill Ridge Trail Improvements

Trail Parking and Restroom

Two parking areas are proposed in the vicinity of Cemetery Gate. Approximately 60 feet north of Cemetery Gate, within the existing corporation/laydown yard and parking area, the SFPUC would construct four Americans with Disabilities Act-compliant parking stalls (approximately 1,000 square feet) and a school bus parking space and turnaround (approximately 10,000 square feet) with signage. The parking spaces would be treated with the same resin surface as the universal access loop trail. The bus zone would be constructed of aggregate base. Approximately 0.5 mile south of Cemetery Gate, the SFPUC would install a new trailhead parking lot and restroom. The parking lot would span approximately 40,000 square feet and be capable of accommodating up to 50 cars, with additional space for horse trailer parking. The new parking area would be constructed of a firm, stable, slip-resistant base in compliance with the Americans with Disabilities Act (e.g., asphalt, pervious concrete). The proposed restroom would consist of a vault toilet, designed and constructed in a manner similar to that described above for the restroom on the southern skyline ridge trail. The parking lot and restroom would be equipped with wildlife-proof trash cans. Figure 2-4 shows the approximate locations of the parking lot and restroom, which are proposed on lands outside of the hydrologic boundary of the watershed.

Security Features

The SFPUC would install road gates and *bollards*[16] on Cahill Ridge Road (a service road) south of Cemetery Gate to limit vehicles to the access road and parking area only. In addition, under the unsupervised access management variants (variants 2 and 3, discussed further in Section 2.7.1, Trail Access Management Program and Visitation), the SFPUC would install barbed-wire fencing along the Fifield-Cahill ridge trail. This fencing would include approximately 8 miles of new fencing along both sides of the trail (16.3 miles in total) between Portola Gate and Cemetery Gate. The barbed-wire fencing components and dimensions would be as described above for the southern skyline ridge trail. The new fencing would be set back from the trail centerline by up to 50 feet, as topography and vegetation allow.

The SFPUC would repair and improve the gates and fencing at existing Fifield-Cahill ridge trail accessways. At Portola Gate, the approximately 160 linear feet of 6- to 8-foot-tall chain-link fence that extends from both sides of the gate would be repaired and extended to 240 feet. At Cemetery Gate, approximately 240 feet of 6- to 8-foot-tall fencing extending from the gate would be repaired or replaced.

The unsupervised access variants (variants 2 and 3) include the installation of two lockable gates for maintenance access at approximately 0.25-mile intervals along the perimeter fencing on the eastern frontage of the universal access loop trail. Similarly, under variants 2 and 3, the new fencing along other segments of the Fifield-Cahill ridge trail (east and west) would have gates at approximately 0.5-mile intervals. In addition, the SFPUC would install approximately 560 linear feet of 4-foot-tall split-rail fencing along the western perimeter of the parking lot. None of the project components proposed for the Fifield-Cahill ridge trail would include nighttime lighting.

[16] Short posts spaced near enough to limit the passage of vehicle traffic but wide enough to allow passage by users of other transportation modes (e.g., pedestrians, bicyclists, equestrians).

2.5.2 Trail Easement

The Bay Area Ridge Trail Council has acquired a trail easement from Skylawn Memorial Park along an approximately 1-mile segment of paved roadway within the cemetery. The easement, which is already designated as Bay Area Ridge Trail, extends from the Reflection Circle Drive/Lifemark Road intersection north along Lifemark Road and Cahill Ridge Road to the Skylawn Memorial Park/City and County of San Francisco property boundary (see Figure 2-2). The City and County of San Francisco owns the roadways extending north and south of the easement, which are also already designated as Bay Area Ridge Trail. The SFPUC would accept and record the perpetual easement from the trail council as part of the project to facilitate consistent and efficient management of this portion of the Bay Area Ridge Trail.

2.6 Project Construction

Construction of the proposed trails and trail amenities would generally require clearing, grubbing, tree removal and/or felling, grading, excavation, and compaction; limited paving; and installation of retaining walls, drainage structures, a prefabricated bridge, restrooms, signage, and security features. Table 2-1 presents a summary of anticipated construction activities, durations, equipment, and vehicle trips associated with the main components of the project. In general, project construction would require disturbance over an area of approximately 40 acres, 8 of which would be permanent and 32 of which would be restored following the completion of construction activities. Additional discussion of the construction approach, equipment, workforce, and schedule is presented below.

The portion of the project area along Fifield-Cahill ridge trail between Portola Gate and Skyline Quarry is accessible to watershed visitors under the existing docent program. Under the current program, up to 9,380 visitors per year are allowed to access the Fifield-Cahill ridge trail; however, visitor counts indicate that the number has averaged about 866 people annually over the program's more than 14-year history.[17] During the project's estimated 12-month construction period, portions of the Fifield-Cahill ridge trail could be closed to the public for short periods for safety reasons.

2.6.1 Work Areas and Access Approvals

Construction activities would generally be conducted on lands that are owned by the City and County of San Francisco and managed by the SFPUC. However, portions of the southern skyline ridge trail parking lot, access drives, and trail would be constructed within the Caltrans right-of-way along S.R. 35. In addition, some of the staging areas (described below) would also require temporary use of the Caltrans right-of-way. As a result, the SFPUC would need to obtain an encroachment permit from Caltrans for the construction and operation of the southern skyline ridge trail. Construction worker parking would be accommodated within the limits of the project's proposed access drives, staging areas, and project footprint.

[17] San Francisco Public Utilities Commission, *Annual Fifield-Cahill Ridge Trail Usage, August 23, 2003 Through December 31, 2017*, 2017, Table: Number of Trail Participants/Docents by Event Type.

2.6.2 Construction Site Access

Work crews would generally access the project areas via existing public roadways, including: S.R. 92 and S.R. 35 for the southern skyline ridge trail; and Lifemark Road and Cahill Ridge Road (through Skylawn Memorial Park) and the Cahill Ridge Trail (between Skyline Quarry and Cemetery Gate) for the Fifield-Cahill ridge trail improvements (Figure 2-1).

In general, workers would access construction sites between S.R. 35 and the southern skyline ridge trail alignment via four existing and five new access drives. Figures 2-3a through 2-3e show the locations of the access drives proposed for improvement or creation. Accessway improvement/creation would generally involve clearing, grubbing, minor grading, and compacting. As noted previously, all but one of the access drives would be permanent, and all of them would be constructed of aggregate base. Each access point would be equipped with a permanent lockable gate to prevent unauthorized access. During construction, vehicles, equipment, and personnel would enter and leave the site via these access points. Upon the completion of construction, use of these access points would generally be limited to authorized trail operations and maintenance activities.

2.6.3 Staging Areas

Equipment and materials staging for project construction would take place at 11 designated staging areas within or adjacent to the project footprint, as well as within the footprints of the project components. For the work proposed north of S.R. 92, staging would occur within the proposed parking lot footprint and within an existing disturbed area at the southern terminus of the proposed universal access loop trail, which the SFPUC occasionally uses for local construction and maintenance project staging (see Figure 2-4). Staging for work proposed at locations south of S.R. 92 would occur at various designated staging areas between S.R. 35 and the trail route, as shown in Figures 2-3a through 2-3e. With the exception of the existing staging area at the southern terminus of the proposed loop trail, site preparation for staging areas would generally require clearing, grubbing, minor grading, and compacting. Staging would generally occur on bare ground that has not been reinforced with additional surfacing; however, in some locations rock or gravel might be required to support equipment on soft or muddy soil. Upon the completion of construction, the SFPUC would return the staging areas to their approximate preconstruction conditions.

2.6.4 Site Preparation and Earthwork

Trail construction activities would generally be limited to the area within 10 to 15 feet of the trail centerline (i.e., up to a 30-foot-wide construction area). This area would be reduced where limited by terrain or vegetation and would be increased for facilities proposed at locations that are not immediately adjacent to the trail (e.g., the parking lot and restroom north of S.R. 92). Site preparation of construction areas would generally include clearing and grubbing followed by site grading, which would require the SFPUC to remove up to approximately 170 trees (about 125 trees along the southern skyline ridge trail alignment and up to 45 trees from the Fifield-Cahill and loop trail ridge

TABLE 2-1
SUMMARY OF CONSTRUCTION REQUIREMENTS FOR THE PROJECT

Project Component/ Site	Disturbance (acre)		Impervious Surface	Estimated Construction Duration	Depth of Excavation / Quantity of Excavation and Fill	Construction Vehicle Trips, Truck Trips	Estimated Construction Equipment (Quantity)
	Temporary	Permanent					
Southern Skyline Boulevard Ridge Trail Extension							
Trail Work (including retaining walls, rock spillways, bridge)	17.69	4.58	Retaining wall (4,910 square feet)	7 months	• Depth: 15 inches for trail; 24 inches for walls; 30 feet for bridge piers • Imported fill (trail surface): 63,350 cubic yards • Exported waste: 2,200 cubic yards	• Up to 20 worker vehicles (commute); 60 one-way trips per day • Up to six delivery trucks; 12 one-way trips per day • Up to 40 haul trucks; 80 one-way trips per day	• Flatbed truck to haul equipment (2) • Backhoe/dozer (2) • Compaction equipment (2) • Trucks to deliver materials (4 to 6) • Large backhoe/dozer/excavator (4 to 6) • Trail size backhoe/dozer/excavator (4) • Large compaction equipment (2) • Trail/trench compaction equipment (4) • Trencher (2) • All-terrain vehicle with self-dumping trailer (4) • Bobcat loader (4) • Concrete buggy (2) • Rock rake (2) • Scraper (10-foot-wide maximum) (2) • Paving equipment (asphalt concrete) (2) • Paving equipment (aggregate base) (4) • Haul trucks (fill import/export) (50) • Haul trucks (deliveries) (4 to 6) • Tree removal equipment, as needed (2) • Chipper, as needed (2) • Concrete pump truck (2) • Concrete mixer (4) • Drill rig (H-pile installation) (2) • Crane (bridge installation) (1) • Worker vehicles (commute) (8 to 12)
Access Drives	0.02	0.33	–	2 months	• Depth: 9 inches • Imported fill (access drive surface): 720 cubic yards • Exported waste: 720 cubic yards		
Staging Areas	5.58	–	–	2 months	• Depth: 12 inches • Imported fill: 5,000 cubic yards • Exported waste: 500 cubic yards		
Parking Lot and Driveway	–	0.63	Asphalt concrete (27,450 square feet)	2 months	• Depth: 9 inches • Imported fill (parking lot surface): 820 cubic yards • Exported waste: 710 cubic yards		
Restrooms	–	0.01	Structure (2,560 square feet)	2 weeks	• Depth: 5 feet • Imported fill: 8 cubic yards • Exported waste: 40 cubic yards		
Fencing	2.5	0.35	Fence posts (15,000 square feet)	7 months	• Depth: 3 feet • Imported fill: N/A • Exported waste: 940 cubic yards		
Fifield-Cahill Ridge Trail Improvements							
Trail Work	0.30	0.60	Natural resin (26,000 square feet)	3 months	• Depth: 12 inches • Imported fill (trail surface): 1,370 cubic yards • Exported waste: 150 cubic yards		
Parking Lot	–	0.92	Asphalt concrete or other (40,000 square feet)	2.5 months	• Depth: 9 inches • Imported fill (parking lot surface): 1,480 cubic yards • Exported waste: 1,480 cubic yards		
Accessible Parking Area at Cemetery Gate	–	0.15	Natural resin (6,650 square feet)	1 week	• Depth: 12 inches • Imported fill: 220 cubic yards • Exported waste: 250 cubic yards		
Restroom	–	0.01	Structure (130 square feet)	1 week	• Depth: 5 feet • Imported fill: 5 cubic yards • Exported waste: 20 cubic yards		
Fencing	11.3	0.60	Fence posts (25,962 square feet)	10 months	• Depth: 3 feet • Imported fill: N/A • Exported waste: 854 cubic yards		

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trail alignment) ranging in size from 4 inches to 56 inches in *diameter at breast height*.[18,19] Project earthwork would include the excavation of approximately 7,870 cubic yards of soil. The depths of excavation would vary based on the project component and location. In general, the SFPUC would reuse excavated soil within the project footprint. However, this impact analysis conservatively assumes that excavated material would be hauled off the site. Project construction would require the import of approximately 72,973 cubic yards of material, most of which would be used for trail base and surfacing as well as access drive and parking lot surfacing. If needed, soil or trail/parking lot surfacing materials would be temporarily stockpiled within the project footprint and/or staging areas.

2.6.5 Avoidance of Wetlands and Bridge Installation

During the initial project design phase, the SFPUC identified four small wetland and/or drainage features (referred to generally as "wetlands"): one along the universal access loop trail corridor and three along the southern skyline ridge trail corridor. Figures 2-3b, 2-3c, 2-3d, and 2-4 show the approximate locations of these wetlands. The SFPUC modified the trail designs in each case to minimize wetland encroachment, including by rerouting the loop trail to avoid the wetland, as shown in Figure 2-4.

For the three wetlands along the southern skyline ridge trail, the SFPUC would employ various site-specific methods to minimize wetland encroachment. For example, as noted previously, a prefabricated bridge would span the northernmost of these wetlands (Figure 2-3b). The SFPUC would construct the trail to within approximately 10 feet of the gully formed by the drainage and install a 30-foot-long, 6-foot-wide prefabricated bridge to allow for passage over the gully. The bridge would have four 2-foot-diameter piers on each side covered with approximately 2-foot-deep pile caps. Workers would drill the piers 5 to 10 feet into the underlying rock, approximately 20 to 30 feet below the ground surface. The SFPUC would transport the bridge to the project area via S.R. 35 and from there to the project site by crane. Bridge placement would require intermittent closure of the northbound lane of S.R. 35 for up to three days for site preparation, bridge delivery, crane setup, bridge placement, and site cleanup and materials removal.

As shown in Figure 2-3c, the trail alignment was designed to avoid the second wetland area along the proposed southern skyline ridge trail. However, because of the topography, vegetation, and wetland extent, fencing would need to be sited immediately adjacent to the trail at this location. Fencing would be constructed using approximately four 3-inch *line posts*[20] and eight 1.5-inch *T-posts*[21] to support barbed wire in the wetland area. Workers would install the posts and barbed-wire fencing using hand tools at this location.

18 Diameter at breast height is the tree diameter measured at 4.5 feet above the ground surface.
19 This number includes approximately 30 trees that would be removed in association with Fifield-Cahill ridge trail fencing under variants 2 and 3 (approximately two trees per fence mile), but which would not be removed under the proposed access program or variant 1. Please see Section 2.7.1, Trail Access Management Program and Visitation, for additional discussion of access programs.
20 The load-bearing post for a line of fencing.
21 T-shaped steel post used to hang strands of barbed wire between line posts.

In the vicinity of the third wetland along the proposed southern skyline ridge trail, the SFPUC modified the trail alignment to remove a segment that would have bisected an approximately 2-foot-wide depression through which water drains seasonally from a culvert beneath S.R. 35 (Figure 2-3d). In this case, the SFPUC would construct the trail to a setback distance of approximately 5 feet on either side of the seasonal drainage. There would be no trail improvements within the seasonal drainage and setback area; visitors would be allowed to traverse the unimproved area, and the SFPUC would erect a "watch your step" sign for visitors.

In addition to design changes, the SFPUC would require its contractor to avoid impacts on wetlands north of S.R. 92 and employ a modified construction approach for the trail and fencing segments in the vicinity of wetlands. Under this modified approach, the contractor would conduct a preconstruction survey to determine the exact extent of the wetlands boundaries at the time of construction; erect fencing and signage along the portions of the wetlands adjacent to work areas to prevent unnecessary encroachment into the wetlands during construction; install erosion and sediment control measures such as *fiber rolls*[22] and *silt fences*[23] around the work areas; increase the frequency of environmental inspection and monitoring; provide construction personnel training; and use smaller equipment and hand tools for trail construction near wetlands. The SFPUC would include these measures in the project's bid specifications and make them a requirement of the construction contract.

2.6.6 Fence Installation

As described in Section 2.5.1.1, *Southern Skyline Boulevard Ridge Trail Extension*, and 2.5.1.2, *Fifield-Cahill Ridge Trail Improvements*, under the *Security Features* subheadings, the SFPUC would repair and extend chain-link fencing adjacent to existing access gates. In general, barbed-wire fencing would be installed in areas beyond the limits of the trail and trail construction activity. Along the southern skyline ridge trail, the fencing could be located up to 850 feet from the trail centerline (the existing barbed-wire fence along S.R. 35 would be used wherever possible); along the Fifield-Cahill ridge trail, fencing could be located up to 50 feet from the trail centerline. As with the proposed trail, the topography and vegetation would influence decisions regarding the fencing alignment. As discussed in Section 2.6.5, Avoidance of Wetlands and Bridge Installation, the SFPUC would require its contractor to avoid impacts on wetlands north of S.R. 92 and to employ additional protective measures during construction in the vicinity of wetlands.

Where feasible, the SFPUC would route the barbed-wire fencing to avoid densely vegetated areas. However, where necessary to allow access for fence repairs, replacement, post installation, and stringing of barbed wire, work crews would trim vegetation along the fencing corridor to within 12 inches of ground surface. In such locations, workers would trim vegetation in an area up to 6 feet wide by hand, where feasible. The SFPUC would employ mechanized cutting with a compact utility vehicle, such as a *skid steer*[24] or similar small vehicle, where hand trimming is not feasible. No substantial topsoil disturbance would be expected from hand or mechanized cutting.

[22] Sediment control device made from fibrous organic material (e.g., coconut fibers), rolled inside a tubular mesh sock.
[23] Sediment control device made from porous fabric.
[24] Small, rigid-frame, engine-powered machine with lift arms on which a variety of tools can be attached.

As noted previously, all of the access management program variants call for fencing along the southern skyline ridge trail (see Section 2.7.1, Trail Access Management Program and Visitation, for additional discussion of access management variants). However, along the Fifield-Cahill ridge trail, the SFPUC would install fencing only under the unsupervised/unrestricted and unsupervised/restricted access management program variants (variants 2 and 3). Under the proposed access program and variant 1, the SFPUC would install approximately 9 miles of fencing, and under variants 2 and 3 would install approximately 25 miles of fencing.

Workers would mulch the cut vegetation in place. Upon the completion of construction, the SFPUC would allow the trimmed vegetation along the fencing installation corridor to naturally regrow and would not maintain this area free of vegetation, except where necessary to enable ingress and egress through the proposed access gates. Section 2.5.1, Trail Improvements and Expansions, under the *Security Features* subheadings, provides additional details on the fencing proposed for the southern skyline ridge trail and Fifield-Cahill ridge trail.

2.6.7 Construction Debris Removal and Site Restoration

Upon the completion of construction, the contractor would remove construction debris and waste and haul it off site for disposal, most likely at the Ox Mountain Landfill in Half Moon Bay. Following construction and the removal of construction debris and wastes, workers would return disturbed areas beyond the project footprint to their approximate preconstruction conditions. Restoration of these areas would generally include minor grading, reuse of scarified material (topsoil/mulch) removed during construction, and hydroseeding with a native seed mix appropriate for the area.[25]

2.6.8 Existing Utilities

A number of existing utilities are present in the project area. Pacific Gas and Electric Company (PG&E) and/or AT&T utility lines exist near the proposed parking area north of S.R. 92. There are overhead PG&E and AT&T lines at each end of the proposed southern skyline ridge trail route, as well as buried California Water Service pipelines at the south end of the proposed route. All of the underground lines within the project footprint are expected to be lower than the proposed excavation depth for the trail section of 15 inches, allowing for sufficient clearance. Along the northern segment of the southern skyline ridge trail, a sagging overhead PG&E electrical wire might require modification. No existing culverts or other stormwater infrastructure would be modified.

2.6.9 Project Workforce

Project construction would require up to two construction crews working at the same time. The size of the crews would range from five to 10 workers. Construction of the proposed access program and variant 1 components along the Fifield-Cahill ridge trail would require one crew of up to 10 workers for up to four months. Due to the additional fencing associated with unsupervised

[25] A planting technique that involves spraying a slurry of seed, mulch, fertilizer, and adhesive, often used as an alternative to broadcasting dry seed.

access, up to an additional eight months would be required for construction along the Fifield-Cahill ridge trail under variants 2 and 3. Under the proposed access program and variants, construction of the southern skyline ridge trail and associated facilities south of S.R. 92 would require one crew of up to 10 workers for approximately 12 months. Upon the completion of the Fifield-Cahill trail improvements, the crew could be reassigned to work on the southern skyline ridge trail improvements. Under this peak construction scenario, two crews totaling up to 20 people could work on the southern skyline ridge trail simultaneously for up to eight months. The exact timing and duration of peak construction could change depending on the actual implementation schedule for the project, but this assumption that construction activities could overlap represents the most conservative scenario.

2.6.10 Construction Equipment

Table 2-1 lists the types of equipment that could be required to construct the project components at locations north and south of S.R. 92. As shown in the table, site preparation would require various haul trucks, tree removal equipment, chippers, and scrapers. Trail construction would generally require backhoes and/or dozers of various sizes, in addition to trenchers, scrapers, and a drill rig for the installation of retaining walls. Parking lot and trail surfacing would require various compaction, concrete mixing, and paving equipment. In addition, several light-duty trucks would be needed to transport workers and materials to and within the project site.

2.6.11 Plant Pathogen Prevention

A number of plant pathogens, including *Phytophthora* species (e.g., sudden oak death), are known to occur in the watershed. The SFPUC has worked to prevent the spread of pathogens within the watershed by implementing best practices in its construction projects and ongoing management activities. Accordingly, the SFPUC would include measures in its construction specifications requiring the contractor to control the spread of pathogens during project construction. Appendix D presents these measures, which would include worker training; cleaning and sanitation of vehicles, equipment, and tools prior to entering and leaving worksites; minimizing the movement of soil and plant material within worksites; and restrictions on the import of construction materials, including soil and plant materials.

2.6.12 Construction Schedule

Project construction would begin in the summer of 2020 and could continue into the summer of 2021. During the approximately 12-month construction period, the SFPUC would concurrently construct project components north and south of S.R. 92, as described in Section 2.6.9, Project Workforce. Earthwork would be limited to the fair-weather season, while other types of construction (e.g., fencing, vegetation cutting, signage installation, etc.) would be performed as conditions allow. The SFPUC would conduct all construction on weekdays between 7 a.m. and 6 p.m., and on Saturdays between 9 a.m. and 5 p.m. No nighttime construction is proposed. Traffic control along S.R. 35 (such as decreasing traffic to one-lane, two-way traffic) might be necessary during specific construction activities, such as bridge placement and retaining wall construction adjacent to the roadway. The contractor would be required to submit a transportation

management plan for review and approval by Caltrans, based on the construction approach for these activities. A project speed limit of 15 miles per hour would be enforced on all watershed roads.

As is standard practice for watershed management activities near suitable marbled murrelet nesting habitat, SFPUC would continue to require any construction activities within 0.25 mile of suitable habitat along Fifield-Cahill ridge trail (including brush clearing and mowing) to follow the U.S. Fish and Wildlife Service guidelines for minimizing auditory and visual disturbance to murrelets.[26] For example, the SFPUC would restrict activities that generate very high noise levels (i.e., greater than 91 decibels) to within two hours after sunrise and two hours before sunset at all times of year. In addition, SFPUC would generally require activities that generate very high noise levels to be conducted outside of the marbled murrelet nesting season (March 15 to September 15). However, the SFPUC might allow some activities with such noise levels late in the season (i.e., July to September), if a qualified biologist confirms that, based upon appropriately-timed survey(s), that there is no marbled murrelet nesting activity within 0.25 mile of the noise-generating activity.

2.7 Project Operations and Maintenance

2.7.1 Trail Access Management Program and Visitation

Under the proposed access program, the SFPUC would manage visitation differently for the Fifield-Cahill and southern skyline ridge trails. Visitors to the Fifield-Cahill ridge trail would need a reservation and the supervision of a trained volunteer (i.e., docent), similar to current access restrictions. Visitors to the southern skyline ridge trail would need to obtain an access permit, but would not require a reservation or docent.

During public scoping, the SFPUC received comments requesting that the agency consider additional access options (see Chapter 1, Introduction). In response to these comments, as well as to allow flexibility in crafting an access program that responds to ongoing watershed management requirements and environmental and economic considerations, this EIR evaluates three additional public access program configurations, or variants, with differing levels of restrictiveness. The EIR refers to these variants as access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access). The proposed access program and variants would apply to existing and proposed segments of trail. The SFPUC is expected to select a final access management program after certification of the Final EIR.

[26] U.S. Fish and Wildlife Service (Arcata), Transmittal of Guidance: *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California,* 2006, https://www.fws.gov/arcata/es/birds/mm/documents/MAMU-NSO%20Harassment%20Guidance%20NW%20CA%202006Jul31.pdf, accessed October 10, 2019.

The planning department commissioned a visitor use study to estimate the number of people who would visit the project trails annually.[27] Representing the most conservative scenario (i.e., unsupervised/unrestricted access), the study estimates that approximately 50,020 visitors would use the proposed Fifield-Cahill ridge trail and southern skyline ridge trail annually. The study does not consider the visitor use implications of a docent program or permit program, nor does it address whether visitation would be different if only one of the trails (i.e., Fifield-Cahill ridge trail or southern skyline ridge trail) were opened. As a result, the estimate of 50,020 people per year is considered an upper limit for annual visitation to the project, regardless of whether one or both trails were opened to unsupervised/unrestricted access.[28] While visitation would vary based upon season and weather conditions, the visitor use study estimates an upper limit on average weekly visitation to be approximately 960 people per week.[29] Visitor use numbers are further discussed under the proposed access program and variants, below.

Both the proposed access program and the variants would provide multi-modal access (pedestrians, bicyclists, equestrians). The access program and variants would also include an educational component, which would be based on the Peninsula Watershed Trail Interpretive Master Plan (under development) and tailored to the selected access program. In addition to providing interpretive educational information for recreational trail users, the Peninsula Watershed Trail Interpretive Master Plan would provide for SFPUC- and volunteer-hosted school program visits to the improved trail areas. Under the trail master plan, the SFPUC expects that up to two school groups (e.g., two elementary school classes with teachers/chaperones) of approximately 75 people each might visit the improved ridge trail facilities per weekday (Monday through Friday). These groups could arrive together in one vehicle (i.e., a bus) or in multiple vehicles (approximately 15 cars).

The only dogs permitted on the trails under the proposed access program and variants are service dogs whose presence is required to assist a person(s) with disabilities. Access to Skyline Quarry parking lot would not change. Under the project and variants, trail access would be provided year-round, unless trail closure were required for safety or watershed management, as described in Section 2.7.2, Trails and Facilities Operations and Maintenance, below. The SFPUC would install chain-link fencing improvements at main access points (e.g., Portola Gate and Cemetery Gate), regardless of which access program is selected. The sections below present additional details on the proposed access program and variants.

2.7.1.1 Proposed Access Program

As noted above in Section 2.7.1, Trail Access Management Program and Visitation, the SFPUC would manage visitation to the Fifield-Cahill ridge trail differently from visitation to the southern skyline ridge trail under the proposed access program.

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27 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

28 Ibid.

29 The average weekly visitation of 960 people per week was determined by dividing 50,020 annual visitors by 52 weeks of the year.

Fifield-Cahill Ridge Trail

Under the proposed access program, the SFPUC would allow supervised access to the Fifield-Cahill ridge trail, similar to the docent program presently in place for this trail segment. This program would allow groups of up to 20 hikers, bicyclists, or equestrians, under the supervision of an SFPUC-approved guide. A maximum of three trail event itineraries could be scheduled per day, four days per week (i.e., Fifield-Cahill ridge trail access would be limited to 60 people per day, 240 per week, 12,480 per year).[30]

This trail segment would be accessible to docent-led groups with a reservation during regular business hours, with seasonal adjustments based on the timing of daylight hours. Access would be provided via designated trailheads and watershed access points (e.g., Portola Gate and Cemetery Gate). Each of these access points would have a lockable gate, which would remain closed and locked at all times, except when in use by authorized personnel. Trail users and docents would be instructed to park within designated parking areas (e.g., proposed 50-car parking lot near Cemetery Gate, existing Skyline Quarry parking lot, existing Sneath Lane parking lot). Under the proposed access program, the SFPUC would not install barbed-wire fencing along the Fifield-Cahill ridge trail, and unauthorized people (i.e., those without a reservation) would not be allowed to access the trail.

Southern Skyline Ridge Trail

Under the proposed access program, the SFPUC would allow unsupervised and restricted access to the proposed southern skyline ridge trail. This program would allow hikers, bicyclists, or equestrians to access the southern skyline ridge trail with a permit. Permits could be obtained through the SFPUC's public website or, for those without internet access, by contacting the SFPUC's community liaison. Prior to receiving a permit, applicants would be required to complete an educational program about the watershed's purpose and function, its sensitive resources, and visitor rules and restrictions. Visitors would need to acquire permits in advance of their visit, but would not be able to obtain permits from an onsite kiosk at the southern skyline ridge trail or elsewhere in the watershed. Trail users must have a valid SFPUC permit in their possession while on watershed property, unless accompanied by an authorized permit holder. Permits would be valid for approximately one year and would allow for up to five participants, for whom the permittee would be responsible. SFPUC staff and/or SFPUC-trained volunteers/docents would patrol the trails daily to monitor visitors' activities and check for valid permits and would enforce the permit program and watershed visitation rules.

This trail segment would be accessible to visitors seven days per week, for approximately eight hours per day during daylight hours (depending on the season), with no restrictions on the number

[30] Under the current docent-led access program, far fewer people than the maximum number allowed (i.e., 9,360 people per year, not including docents) have actually visited the watershed. Annual visitation data maintained by the SFPUC for the period 2003 to 2017 indicate that average annual trail usage during this time was 866 people per year, including docents. Peak usage was in 2004 at 1,317 people, including docents. Total usage during this 14-year period was 12,995, of which 11,088 were visitors (i.e., not docents).

San Francisco Public Utilities Commission, *Annual Fifield-Cahill Ridge Trail Usage, August 23, 2003 Through December 31, 2017*, 2017, Table: Number of Trail Participants/Docents by Event Type.

of trail users. Under the proposed access program, interest in visitation to the southern skyline ridge trail is expected to increase; however, the permit restriction is expected to reduce the number of visitors to this trail segment relative to that expected if visitation were unrestricted.

For the above reasons, this EIR assumes that total annual visitation under the proposed access program is somewhat less than 50,020 people per year (which includes up to 12,480 visitors per year on Fifield-Cahill ridge trail under the docent program on that segment), which represents the upper limit estimated for unsupervised/unrestricted visitation to project trails, as identified in the visitor use study.[31]

Under the proposed access program for the southern skyline ridge trail, visitor access would be provided via designated trailheads and watershed access points. Each of these access points would have a lockable gate, which would remain locked except during the above-referenced daylight access hours. The SFPUC would install one-way pedestrian gates at each trailhead gate and approximately 9 miles of barbed-wire fencing along the southern skyline ridge trail.

2.7.1.2 Access Program Variant 1 (Docent Program)

Under access program variant 1, the SFPUC would allow supervised access to trails within the watershed. Similar to the docent program currently in place and the proposed access program for the Fifield-Cahill ridge trail, access program variant 1 would enable groups of up to 20 hikers, bicyclists, or equestrians, under the supervision of an SFPUC-approved guide, to access the Fifield-Cahill ridge trail and/or the southern skyline ridge trail. Under access program variant 1, a maximum of three trail event itineraries would be scheduled each day, four days per week. As with the proposed access program for the Fifield-Cahill ridge trail, access under this variant would be limited to 60 people per day, 240 per week, 12,480 per year, per trail segment (i.e., Fifield-Cahill ridge trail and southern skyline ridge trail, as applicable), for a total of up to 24,960 visitors per year.[32] These trail segment(s) would be accessible to docent-led groups with a reservation. Access would be provided via designated trailheads and watershed access points (e.g., Portola Gate, Cemetery Gate, and proposed trailheads at S.R. 92 and S.R. 35). As with the proposed access program for the Fifield-Cahill ridge trail, each of these access points would have a lockable gate, which would remain closed and locked at all times, except when in use by authorized personnel.

Trail users and docents under variant 1 would park within designated parking areas (e.g., proposed 50-car parking lot near Cemetery Gate, existing Skyline Quarry parking lot, proposed 20-car parking lot near the Caltrans vista point on S.R. 35, existing Sneath Lane parking lot). Under this

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31 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

32 Under the current docent-led access program, far fewer people than the maximum number allowed (i.e., 9,360 people per year, not including docents) have actually visited the watershed. Annual visitation data maintained by SFPUC for the period 2003 to 2017 indicate that average annual trail usage during this time was 866 people per year, including docents. Peak usage was in 2004 at 1,317 people, including docents. Total usage during this 14-year period was 12,995, of which 11,088 were visitors (i.e., not docents).

San Francisco Public Utilities Commission, *Annual Fifield-Cahill Ridge Trail Usage, August 23, 2003 Through December 31, 2017*, 2017, Table: Number of Trail Participants/Docents by Event Type.

variant, the SFPUC would install approximately 9 miles of barbed-wire fencing along the southern skyline ridge trail but not along the Fifield-Cahill ridge trail. Unauthorized people (i.e., those without a reservation) would not be allowed to access the watershed.

2.7.1.3 Access Program Variant 2 (Unsupervised/Unrestricted Access)

Under access program variant 2, the SFPUC would allow unsupervised and unrestricted access to trails within the watershed. Unlike the docent program, the variant 2 program would enable hikers, bicyclists, or equestrians without a reservation or guide to access the Fifield-Cahill ridge trail and/or the southern skyline ridge trail.

Under variant 2, unsupervised and unrestricted access would be allowed seven days per week, for approximately eight hours per day during daylight hours, with no restrictions on the number of trail users. Accordingly, annual visitation under variant 2 is expected to increase to approximately 50,020 people per year, which represents the upper limit estimated for unsupervised/unrestricted visitation to project trails, as identified in the visitor use study.[33]

Access would be provided via designated trailheads and watershed access points. Each of these access points would have a lockable gate, which would remain locked except during the above-referenced daylight access hours. The SFPUC would install one-way pedestrian gates at each trailhead gate, approximately 9 miles of barbed-wire fencing along the southern skyline ridge trail, and approximately 25 miles of barbed-wire fencing along the Fifield-Cahill ridge trail between Portola Gate and Skyline Quarry (including the universal access loop trail). At each trailhead, the workers would erect signs that list visitor rules, and SFPUC staff and volunteers would communicate these rules to visitors, as necessary, during routine patrols.

2.7.1.4 Access Program Variant 3 (Unsupervised/Restricted Access)

Under access program variant 3, the SFPUC would allow unsupervised and restricted access to trails within the watershed. Similar to the unsupervised and unrestricted program (variant 2), variant 3 would enable hikers, bicyclists, or equestrians to access the Fifield-Cahill ridge trail and/or the southern skyline ridge trail unsupervised; however, under variant 3, visitors would be required to first obtain a permit.

Access program variant 3 would involve the same type of permitting described for the southern skyline ridge trail under the proposed access program. Permits would be available from the SFPUC's website or community liaison, and permit applicants would be required to complete an educational program. Visitors would need to obtain permits in advance of their visit and to keep a valid SFPUC permit in their possession while on watershed property, unless accompanied by an authorized permit holder. Permits would be valid for approximately one year and would

[33] CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

allow for up to five participants, for whom the permittee would be responsible. The SFPUC would enforce the permit program and watershed visitation rules.

Similar to the proposed access program for the southern skyline ridge trail, variant 3 would allow unsupervised/restricted access seven days per week, for approximately eight hours per day during daylight hours (depending on the season), with no restrictions on the number of trail users. Visitation to the project trails is assumed to increase; however, the permit requirement is expected to reduce annual visitation under access program variant 3 to less than 50,020 people per year, which represents the upper limit estimated for unsupervised/unrestricted visitation to project trails, as identified in the visitor use study.[34]

Visitor access would be provided via designated trailheads and watershed access points. Each of these access points would have a lockable gate, which would remain locked except during the above-referenced daylight access hours. The SFPUC would install one-way pedestrian gates at each trailhead gate, approximately 9 miles of barbed-wire fencing along the southern skyline ridge trail, and approximately 25 miles of barbed-wire fencing along the Fifield-Cahill ridge trail between Portola Gate and Skyline Quarry (including the universal access loop trail).

2.7.2 Trail and Facilities Operations and Maintenance

This subsection summarizes the various operations and maintenance activities proposed for the project. The types of activities would generally be the same regardless of the selected access management program. However, the intensity of such activities would be expected to increase with visitation (i.e., less intense under docent access, greater with unsupervised access). As discussed further in Section 2.6.12, Construction Schedule, SFPUC would continue to require any construction activities within 0.25 mile of suitable habitat along Fifield-Cahill ridge trail (including brush clearing and mowing) to follow the U.S. Fish and Wildlife Service guidelines for minimizing auditory and visual disturbance to murrelets. These restrictions would generally limit operations and maintenance activities near suitable habitat to within two hours after sunrise and before sunset, and outside the nesting season (March 15 to September 15).

2.7.2.1 Infrastructure Maintenance

Upon the completion of construction, SFPUC staff would maintain the project components in a manner similar to that of other trails and trail facilities in the watershed. As with existing facilities, the SFPUC would manage and maintain the new trail segments and facilities in accordance with the Peninsula Watershed Management Plan. Typical maintenance activities would include periodic (e.g., monthly) inspection of trail infrastructure, such as the trail and parking lot surfaces, retaining walls, and drainage facilities), with more frequent inspection of restroom and security facilities (i.e., weekly). In addition, the SFPUC would continue to maintain (e.g., patch) watershed roads, including portions of the Fifield-Cahill ridge trail, every two to five years.

The project would increase the level of routine watershed maintenance, with repairs to project facilities occurring quarterly, if not more frequently; for example, after storm events, facilities

[34] Ibid.

inspections and repairs would occur on a daily to weekly basis. In addition, SFPUC staff would continue to conduct regular security patrols. The level of increase would depend on which access program is selected; for example, vault toilets would be pumped out and trash cans emptied as needed based on use and would be serviced daily.

2.7.2.2 Vegetation Maintenance

The SFPUC currently implements vegetation management activities along the Fifield-Cahill ridge trail in the vicinity of existing watershed facilities and would implement similar vegetation management to maintain access to the new project components and reduce fire and tree-fall hazards in their vicinity. Generally, these activities would occur within a buffer area of about 5 to 10 feet on either side of the proposed universal access loop trail and southern skyline ridge trail alignments, as well as around the proposed parking lots, restrooms, trailheads, and access gates. Vegetation management methods could include hand removal (e.g., pruning), mechanical removal (e.g., mowing or string-cutting), and herbicide applications. SFPUC staff would continue to annually mow the Fifield-Cahill ridge trail edges to reduce ignitable fuels, and periodically mow or masticate the vegetated fuelbreak network to reduce fuels where roadways are co-located with vegetated fuelbreaks. Vegetation management could also include hydroseeding, seeding, and/or planting *propagules*[35] and new trees and shrubs in areas where habitat enhancement or erosion control are needed.

Prior to undertaking vegetation maintenance and consistent with current practice, SFPUC staff would conduct a biological survey to determine whether the area contains special-status species and habitat, as well as to identify and avoid bird nests. Surveyors would flag and map special-status plant species, including host plants for special-status butterflies, in the field for avoidance. Currently, the SFPUC uses survey markers to delineate areas of sensitive species avoidance. The SFPUC biologist would upload location information for special-status species to a database, which would be available to the maintenance operator.

2.7.2.3 Operations and Maintenance Staffing

Trail operations and maintenance would occur during normal business hours, Monday through Friday, and occasionally on weekends, as needed. With the exception of restroom pumping, which an outside contractor would perform, SFPUC staff would conduct this work. However, depending on the access program selected, these tasks could require additional staff. Therefore, this EIR conservatively assumes up to one additional staff person and 10 volunteers could be required to support project operations. On occasion, regardless of the program selected, it might be necessary to periodically close the trail for public safety reasons (e.g., National Weather Service red flag days, fire suppression**,** firefighting) and for watershed management and trail maintenance issues.

[35] A plant part, such as a bud, sprout, or cutting, used to propagate a new plant.

2.8 Intended Uses of the EIR and Approvals Required

An EIR is an informational document intended to inform the public and public agency decision-makers of the environmental consequences of a proposed project and to present mitigation measures and feasible alternatives to avoid or reduce the adverse environmental effects of that project. As discussed in Section 2.2, Background, the 2001 Peninsula Watershed Management Plan EIR identifies and evaluates key elements of the project at a program level of detail. While much of that document's analysis and conclusions remain relevant, the project has been further defined, allowing for a more detailed analysis of potential impacts. Thus, this EIR provides a project-level evaluation of potential significant environmental impacts that could result from the project. Where appropriate, this EIR incorporates, by reference, setting information, analysis, and conclusions from the management plan EIR that remain valid and applicable to the project.

The San Francisco Planning Department is the CEQA lead agency for the project. The sections below summarize the permits and approvals that could be required for the project. Unless otherwise specified, the listed permits and approvals would be required for the proposed program and each variant. Additional regulatory approvals could be required if local, state, or federal agencies determine that specific construction activities fall under their jurisdiction.

2.8.1 Federal

- Federal Highway Administration issuance of grant funding for construction of the southern skyline ridge trail after completion of National Environmental Policy Act compliance (Caltrans acting as lead agency)
- U.S. Fish and Wildlife Service consultation under section 7 of the Federal Endangered Species Act
- U.S. Fish and Wildlife Service biological opinion or habitat conservation plan, if the project cannot avoid substantial adverse effects on federally listed species
- California State Historic Preservation Office consultation under section 106 of the National Historic Preservation Act

2.8.2 State

- Caltrans encroachment permit for construction-related activity
- Caltrans transportation permit, if project work requires oversized or excessive-load vehicles on state roadways
- California Department of Forestry and Fire Protection permit, or determination of exemption from permit requirements, for the removal of trees in a timberland area
- California Endangered Species Act permit, if the project cannot avoid substantial adverse effects on species listed under the act

2.8.3 Local

- San Francisco Planning Commission certification of the final EIR and determination of consistency with the San Francisco General Plan
- SFPUC approval of construction contracts and other project implementation actions
- San Francisco Board of Supervisors, consideration of any final EIR appeal and appropriation of project funding

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CHAPTER 3
Plans and Policies

3.1 Overview

Pursuant to the California Environmental Quality Act (CEQA) Guidelines section 15125(d), this chapter describes land use plans and policies generally and the manner in which they apply to the Southern Skyline Boulevard Ridge Trail Extension ("project"), and identifies the potential for the project to conflict with those plans or policies adopted for the purpose of avoiding or mitigating environmental effects. However, the intent of CEQA is to determine whether a project would result in physical changes that have significant effects on the environment. Thus, policy conflicts do not, in and of themselves, indicate a significant environmental effect. Many of the plans of the City and County of San Francisco and the other relevant jurisdictions contain policies that address multiple goals pertaining to different resource areas. To the extent that physical environmental impacts of the project could result from conflicts with one of the goals related to a specific resource topic, the environmental impact report (EIR) analyzes such impacts in the respective topical sections of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures.

Land use plans typically contain numerous policies emphasizing differing legislative goals, and an interpretation of consistency requires a balancing of all relevant policies. The board or commission that enacted the plan or policy determines the meaning of such policies and how individual projects satisfy those policies at the time it considers the approval of the project. At the time of project approval, the agency charged with making consistency determinations will decide whether a project is consistent with particular plans. For example, the San Francisco Planning Department and Planning Commission will evaluate this project in accordance with the San Francisco General Plan. The San Francisco Public Utilities Commission (SFPUC) will evaluate the project in accordance with various adopted policies as discussed below. In each case, the approving or reviewing agency will consider any potential inconsistencies between the project and adopted plans or policies in the context of all applicable objectives and policies and determine consistency based on a balancing of relevant policies as part of the decision process.

The plans and policies addressed in this chapter include the following:

- **U.S. Department of the Interior, Golden Gate National Recreation Area** – Scenic Easement and Scenic and Recreation Easement

- **City and County of San Francisco** – San Francisco Charter, section 4.112; San Francisco General Plan; Accountable Planning Initiative; San Francisco Sustainability Plan; and San Francisco Greenhouse Gas Reduction Ordinance
- **San Francisco Public Utilities Commission** – SFPUC Strategic Sustainability Plan, Peninsula Watershed Management Plan, Water Enterprise Environmental Stewardship Policy, and Right-of-Way Integrated Vegetation Management Policy
- **State and Regional Agencies** – California Department of Fish and Wildlife Game Refuge Designation, Bay Area Air Quality Management District Bay Area 2017 Clean Air Plan, and San Francisco Bay Regional Water Quality Control Board Water Quality Control Plan for the San Francisco Bay Basin
- **Local Agencies** – San Mateo County General Plan and the San Mateo County Trails Plan

The project is located on extraterritorial lands owned by the City and County of San Francisco in unincorporated San Mateo County, lands owned by Skylawn Memorial Park (public access easement), and portions of the California Department of Transportation (Caltrans) right-of-way.

Section 2.8 of Chapter 2, Project Description, describes the permits and approvals required for the project. Sections 4.2 through 4.11 of Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, each describe pertinent resource-specific plans (e.g., air quality management and greenhouse gas emission reduction plans are discussed in sections 4.6 (Air Quality) and 4.7 (Greenhouse Gases); natural resource management plans are discussed in Section 4.8 (Biological Resources); and water quality control plans are discussed in Section 4.10 (Hydrology and Water Quality).

3.2 U.S. Department of the Interior, Golden Gate National Recreation Area – Scenic Easement and Scenic and Recreation Easement

In 1969, the City and County of San Francisco granted an approximately 19,000-acre scenic easement covering the lands west of Crystal Springs and San Andreas reservoirs, and an approximately 4,000-acre scenic and recreation easement covering lands to the east of the reservoirs to the U.S. Department of the Interior. In 1980, the responsibility for administering the easements was transferred to the National Park Service-Golden Gate National Recreation Area.[1] The easements provide for review of SFPUC decisions made with regard to the use of these lands.[2] The purposes of the easements are primarily to preserve the land "in its present natural state and shall not be used for any purpose other than for the collection, storage and transmission

[1] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.A, Existing Plans & Policies (p. III.A-12). Planning Department Case No. 96.222E, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343*, accessed May 18, 2018.

[2] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section I, Summary (p. 1-14).

of water and protection of water quality, and other purposes, which shall be compatible with said use and preserving said land as open-space land."[3]

Although the SFPUC retains fee ownership of the land and the Peninsula Watershed is not part of a national park or recreation area, the National Park Service can object to development unrelated to utility management or other uses not permitted by the terms of the easements. However, San Francisco is not bound by National Park Service planning mandates or procedures that the Golden Gate National Recreation Area must follow.[4] As fee owner, San Francisco has retained the right to allow public access to watershed lands, including the Fifield and Cahill ridges and areas along the proposed southern skyline boulevard ridge trail. The SFPUC considers public recreational access on watershed lands and the associated water-supply-related educational opportunities it affords as compatible uses.

All work that would occur under the project, including any structures and associated signage, would be in support of public recreational access and educational opportunities. The project would not involve the types of substantial excavation or topographic changes prohibited under the easements. And all tree and brush removal would be required for public recreational access, compatible with the collection, storage, and transmission of water and protection of water quality. For the above reasons, the project would be consistent with the terms of the easements.

3.3 City and County of San Francisco Plans and Policies

San Francisco land use plans and policies are primarily applicable to projects within the jurisdictional boundaries of the city of San Francisco, although in some cases they may apply to projects outside of these boundaries. These plans include the San Francisco General Plan, which sets forth the city's comprehensive, long-term land use policy; the San Francisco Accountable Planning Initiative, which serves as the basis for resolving inconsistencies in the San Francisco General Plan; the San Francisco Sustainability Plan, which addresses the City's long-term sustainability; and the San Francisco Greenhouse Gas Reduction Ordinance, which establish greenhouse gases reduction emissions targets.

3.3.1 Extraterritorial Lands (San Francisco Charter, Section 4.112)

San Francisco has authority (San Francisco Charter, section 4.112) over the management, use, and control of land it owns outside of the city, subject to the SFPUC's exclusive responsibility for the construction, management, use, and control of the city's water supplies and utilities (San Francisco

[3] City and County of San Francisco, U.S. Department of the Interior, State of California, and San Mateo County, *Grant of Scenic Easement*. Serial Number 3301.4AC. May 2, 1969.
City and County of San Francisco, U.S. Department of the Interior, State of California, and San Mateo County, *Grant of Scenic and Recreation Easement*. Serial Number 3301.3AC. May 2, 1969. These documents (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

[4] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.A, Existing Plans & Policies (p. III.A-12).

Charter, section 8B.121).[5] Accordingly, San Francisco relies on its own plans and policies with respect to extraterritorial lands, as applicable.

Under California Government Code sections 53090 and 53091, cities and counties are exempt from complying with each other's building code and zoning ordinances. The SFPUC is therefore exempt from the building and zoning laws of other cities and counties. The SFPUC seeks to work cooperatively with local jurisdictions where San Francisco-owned facilities are sited outside of San Francisco to avoid conflicts with local building and zoning codes. Also, the SFPUC is required under Government Code section 65402(b) to inform local governments of its plans to construct projects. The local governments have a 40-day review period to determine project consistency with their general plans. Under this requirement, the cities' or counties' determinations of consistency are advisory to the SFPUC rather than binding.

3.3.2 San Francisco General Plan

The San Francisco General Plan, as amended, sets forth the comprehensive, long-term land use policies for San Francisco. One of the basic goals of the general plan is "coordination of the growth and development of the city with the growth and development of adjoining cities and counties and of the San Francisco Bay Region."[6] The general plan consists of 10 issue-oriented plan elements: Air Quality, Arts, Commerce and Industry, Community Facilities, Community Safety, Environmental Protection, Housing, Recreation and Open Space, Transportation, and Urban Design. These elements set forth goals, policies, and objectives for the physical development of San Francisco.

The general plan elements that might be relevant to the project are described in the following paragraphs:

- The **Air Quality Element** promotes clean air planning through objectives and policies that ensure compliance with air quality regulations and minimize particulate matter emissions from road and construction sites.
- The **Environmental Protection Element** addresses the impact of urbanization on the natural environment by promoting the protection of plant and animal life and freshwater sources and addresses San Francisco's responsibility to provide a permanent, clean water supply to meet present and future needs, and to maintain an adequate water distribution system.
- The **Recreation and Open Space Element** contains objectives and policies related to maintaining, creating, and enhancing recreational and open space resources.

As discussed in sections 4.6 and 4.7, Air Quality and Greenhouse Gas Emissions, respectively, project construction and operations would generate emissions of criteria air pollutants and greenhouse gases. Compliance with applicable air quality regulations and implementation of mitigation measures, consistent with the general plan's air quality polices, would reduce these impacts.

[5] City and County of San Francisco, *Municipal Code - 1996 Charter. Supp. No.1*, September 2006.
[6] City and County of San Francisco, *San Francisco General Plan,* 1988, as amended through 1996.

As discussed in Section 4.8, Biological Resources, project construction and operation could adversely affect sensitive and special status species and habitats. Compliance with applicable biological resources regulations, and implementation of mitigation measures, consistent with general plan environmental protection policies, would reduce these impacts. As also discussed in Section 4.8, unsupervised public access within the watershed could accelerate dispersal of sudden oak death, resulting in effects on sensitive natural communities, which would not advance individual general plan habitat protection policies.

As discussed in Chapter 2, Project Description, and Section 4.12, Topics Not Requiring Detailed Environmental Analysis, the project could temporarily displace a small number of would-be trail users during the construction period. However, ample alternative recreational sites exist nearby and, when completed, the project would expand recreational opportunities, consistent with the general plan's recreation policies that encourage expanded public access to the City's watershed lands in a manner consistent with protection of water quality and biological resources.

On balance, the project does not appear to be inconsistent with the general plan. The city's decision-makers ultimately determine whether, on balance, the project is consistent with the general plan. The consistency of the project with the goals, policies, and objectives of the general plan that do not relate to physical and environmental issues will be considered by decision-makers as part of their assessment of whether to approve or disapprove the project. Any potential conflicts identified as part of the City's approval process would not alter the physical environmental effects of the project.

3.3.3 Accountable Planning Initiative

In November 1986, the voters of San Francisco approved Proposition M, the Accountable Planning Initiative, which added section 101.1 to the Planning Code to establish eight priority policies as a preamble to the San Francisco General Plan. The priority policies serve as the basis upon which inconsistencies in the general plan are resolved. The priority policies are as follows:

1. Neighborhood-serving retail uses shall be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses enhanced.
2. Housing and neighborhood character shall be conserved and protected in order to preserve the cultural and economic diversity of the neighborhoods.
3. The City's supply of affordable housing shall be preserved and enhanced.
4. Commuter traffic shall not impede the Muni transit service or overburden streets or neighborhood parking.
5. Diverse economic base shall be maintained by protecting industrial and service sectors from displacement by commercial office development, and future opportunities for resident employment and ownership in these sectors be enhanced.
6. The City shall achieve the greatest possible preparedness to protect against injury and loss of life in an earthquake.
7. Landmarks and historic buildings shall be preserved.

8. Parks and open space and their access to sunlight and vistas shall be protected from development.

In accordance with the Accountable Planning Initiative, prior to issuing a permit for any project, or adopting legislation that requires environmental review under the CEQA, or adopting any zoning ordinance of development agreement, and before taking any action that requires a finding of consistency with the general plan, San Francisco is required to make a determination regarding the consistency of the project with the priority policies. As described further in Chapter 2, Project Description, and Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the project does not propose and would not affect retail uses or employment opportunities; housing or commercial office development; or commuter transit, or neighborhood streets or parking. Nor would the project involve any actions that detract from earthquake preparedness, preservation of historic buildings, or loss of parks or open space to development. Regarding the latter, the project would expand public access to open space within the Peninsula Watershed. For these reasons, the project would be consistent with the Accountable Planning Initiative.

3.3.4 San Francisco Sustainability Plan

The San Francisco Board of Supervisors endorsed the Sustainability Plan for the City of San Francisco in 1997, although the board has not committed San Francisco to perform the actions addressed in the plan. The plan serves as a blueprint for sustainability, with many of its individual proposals requiring further development and public comment. The plan's underlying goals are to maintain the physical resources and systems that support life in San Francisco and to create a social structure that will allow such maintenance. It is divided into 15 topic areas, some of which address specific environmental issues: air quality, biodiversity, energy, climate change and ozone depletion, food and agriculture, hazardous materials, human health, parks, open spaces and streetscapes, solid waste, transportation, and water and wastewater. Other topic areas are broader in scope and cover many issues: the economy and economic development, environmental justice, municipal expenditures, public information and education, and risk management. Each topic area has a set of indicators that is to be used over time to determine whether San Francisco is moving in a direction that supports sustainability for that area.

The project would advance long-term objectives of providing parks, recreational, and open space opportunities for San Francisco residents, visitors, and wildlife. At the same time, expanded unsupervised access in the watershed could result in increased spread of plant pathogens, which could adversely affect sensitive natural communities, which could complicate achieving the plan's objectives regarding biodiversity. Project implementation could have other effects related to air quality, greenhouse gases, biological resources, hazards, transportation, and water quality. As discussed in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, the SFPUC would reduce these impacts through compliance with applicable regulations and implementation of mitigation. Taken together, the project does not appear to be inconsistent with the sustainability plan.

3.3.5 San Francisco Greenhouse Gas Reduction Ordinance

In May 2008, San Francisco adopted Ordinance No. 81-08 amending the San Francisco Environment Code to establish greenhouse gas emissions targets and departmental action plans and to authorize the San Francisco Department of the Environment to coordinate efforts to meet these targets.[7] The City ordinance establishes the following greenhouse gas emissions reduction limits and target dates by which to achieve them:

- Determine 1990 citywide greenhouse gas emissions by 2008, the baseline level, with reference to which target reductions are set
- Reduce greenhouse gas emissions by 25 percent below 1990 levels by 2017
- Reduce greenhouse gas emissions by 40 percent below 1990 levels by 2025
- Reduce greenhouse gas emissions by 80 percent below 1990 levels by 2050

The City's greenhouse gas reduction targets are consistent with—in fact, more ambitious than—those set forth in Governor Brown's Executive Order B-30-15 and Senate Bill 32 by targeting a 40 percent reduction by 2025 rather than a 40 percent reduction by 2030. As described in Section 4.7, Greenhouse Gases, the project would conform to city and state regulations and plans governing greenhouse gas emissions and reductions.

3.4 SFPUC Plans and Policies

The SFPUC has adopted various plans and policies that direct its activities, including the Strategic Sustainability Plan, the Peninsula Watershed Management Plan, the Water Enterprise Environmental Stewardship Policy, and the Right-of-Way Integrated Vegetation Management Policy, all of which are relevant to the project and are described below.

3.4.1 SFPUC Strategic Sustainability Plan

The SFPUC's sustainability goals include providing customers with high-quality, efficient, and reliable water, power, and sewer services in a manner that is inclusive of environmental and community interests and also sustaining the resources entrusted to the SFPUC's care. The 2011 Strategic Sustainability Plan provides a framework for planning, managing, and evaluating SFPUC wide performance in meeting this goal. The plan considers the long-term economic, environmental, and social impacts of the SFPUC's business activities. This plan consists of a Durable section, which contains goals, objectives, and performance indicators to implement SFPUC's vision and values. The goals and objectives are then used to drive the plan's Dynamic section, which contains specific actions, targets, measures, and budgeting. The SFPUC uses this document to evaluate its performance semiannually, to provide an annual score card, and to help it measure sustainability progress annually. The plan contains actions to develop land use

[7] City and County of San Francisco, *Strategies to Address Greenhouse Gas Emissions, Greenhouse Reduction Strategy. Appendix B: 2008 GHG Reduction Ordinance and applicable CEQA documentation,* November 2010.

guidance by incorporating the Environmental Stewardship Policy and other land management principles for San Francisco properties.

The project's proposed access program along Fifield-Cahill ridge trail and variant 1 (docent program), with mitigation, would not conflict with the sustainability plan because they would provide public access, recreational opportunities, and watershed educational opportunities in a manner that is compatible with protection of water quality, public health and safety, biological resources, and other key elements of SFPUC's vision and values. The proposed access program along southern skyline ridge trail and variants 2 (unsupervised/unrestricted access) and 3 (unsupervised/restricted access) would similarly advance sustainability plan objectives in this regard. At the same time, the proposed access program along the southern skyline ridge trail and access program variants 2 and 3 along both the Fifield-Cahill ridge trail and southern skyline ridge trail could result in accelerated dispersal of plant pathogens. Similarly, variants 2 and 3 along Fifield-Cahill ridge trail could result in substantial adverse effects on special-status butterflies, amphibians, and reptiles. As a result, unsupervised watershed access could run counter to certain sustainability plan objectives regarding habitat protection. Overall, the project would not be inconsistent with the sustainability plan's primary objectives.

3.4.2 Peninsula Watershed Management Plan

The Peninsula Watershed encompasses 23,000 acres of San Francisco-owned lands in San Mateo County located generally west of I-280 and within the drainage areas of Pilarcitos, San Mateo, and San Andreas Creeks. The SFPUC adopted the management plan in 2002 to provide a policy framework to make decisions about activities that are appropriate on watershed lands.[8] The management plan provides goals, policies, and management actions that address watershed activities and reflect the unique qualities of the watershed. The management plan is also intended for use by the SFPUC as watershed management implementation guidelines. SFPUC watershed lands are managed by the SFPUC Natural Resources and Lands Management Division, Watershed Resource Management Section. All of the project components are within the boundaries of the management plan area.

As part of implementation of the management plan, the SFPUC reviews all plans, projects, and activities that occur within the watershed for conformity with the management plan and for compliance with environmental codes and regulations. To accomplish this, the SFPUC has established a project review team with members from various SFPUC departments as well as the City Attorney's office. Appropriate SFPUC personnel review proposals for new facilities, structures, roads, trails, projects, and leases or for improvements to existing facilities. Projects subject to this review include those that involve construction, digging or earthmoving, clearing, installation, use of hazardous materials, or other disturbance to watershed resources. In addition, projects that involve the issuance of new or revised leases and permits are subject to this review procedure.

The SFPUC considers water quality protection to be the first and foremost goal of the management plan. The goals and policies are organized around the primary goal of water quality protection

[8] San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018.

and secondary goals pertaining to the local water supply, natural resources, watershed protection, land use compatibility, fiscal management, and public awareness. The primary and secondary goals of the management plan are listed below.

Primary Goal

- Maintain and improve source water quality to protect public health and safety.

Secondary Goals

- Maximize water supply.
- Preserve and enhance the ecological and cultural resources of the watershed.
- Protect the watersheds, adjacent urban areas, and the public from fire and other safety hazards.
- Continue existing compatible uses and provide opportunities for potential compatible uses on watershed lands, including educational, recreational, and scientific uses.
- Provide a fiscal framework that balances financial resources, revenue-generating activities, and overall benefits and an administrative framework that allows implementation of the watershed management plans.
- Enhance public awareness of water quality, water supply, conservation, and watershed protection issues.

SFPUC has developed policies from these goals, which serve as the framework to guide ongoing decision-making by the SFPUC and other responsible parties. The management plan policies are organized into 11 major topic areas, including water quality, water supply, vegetation, wildlife, aquatic resources, cultural resources, fire, safety and security, watershed activities, public awareness, and administrative and finance.

The project's proposed access program along Fifield-Cahill ridge trail and access program variant 1, with mitigation, would advance the primary and secondary goals of the management plan because they would provide public access, recreational opportunities, and watershed educational opportunities in the watershed that is compatible with protection of water quality, public health and safety, biological resources, and other key watershed management priorities. Under the proposed access program along southern skyline ridge trail and variants 2 and 3, the project, with mitigation, would similarly proceed in a manner consistent with most primary and secondary goals. At the same time, as discussed in Section 4.8, Biological Resources, unsupervised public access under the proposed access program along southern skyline ridge trail and variants 2 and 3 along both the Fifield-Cahill ridge trail and southern skyline ridge trail could result in accelerated dispersal of plant pathogens. Similarly, variants 2 and 3 along Fifield Cahill ridge trail could result in substantial adverse effects on special-status butterflies, amphibians, and reptiles. As a result, unsupervised watershed access could make it more challenging to achieve the management plan's goal of preserving and enhancing ecological resources in the watershed. On balance, the project would not be inconsistent with the primary goal of the Peninsula Watershed Management Plan.

3.4.3 Water Enterprise Environmental Stewardship Policy

Adopted in June 2006, the Water Enterprise Environmental Stewardship Policy established the long-term management direction for San Francisco-owned lands and natural resources affected by operation of the SFPUC regional water system within the Tuolumne River, Alameda Creek, and Peninsula watersheds.[9] It also addresses rights-of-way and properties in urban surroundings under SFPUC management. The policy includes the following:

- The SFPUC will proactively manage the watersheds under its responsibility in a manner that maintains the integrity of the natural resources, restores habitats for native species, and enhances ecosystem function.
- To the maximum extent practicable, the SFPUC will ensure that all operations of the SFPUC water system (including water diversion, storage, transport, and discharges of water); construction and maintenance of infrastructure; land management policies and practices; purchase and sale of watershed lands; and lease agreements for watershed lands protect and restore native species and the ecosystems that support them.
- The SFPUC will operate the SFPUC water system in a manner that protects and restores native fish and wildlife downstream of SFPUC dams and water diversions, within SFPUC reservoirs, and on SFPUC watershed lands.
- The SFPUC will actively monitor the health of terrestrial and aquatic habitats, both under SFPUC ownership and affected by SFPUC operations, in order to continually improve ecosystem health.
- The SFPUC will manage rights-of-way and properties in urban surroundings under its management in a manner that protects and restores habitat value where available and encourages community participation in decisions that significantly interrupt or alter current land use in these parcels.

Key implementation strategies of the Environmental Stewardship Policy include implementation and update of the management plan; development of a conservation plan for the Peninsula Watershed; and development of the Watershed and Environmental Improvement Program,[10] which includes the Peninsula Watershed.

The project's proposed access program along Fifield-Cahill ridge trail and variant 1 would advance the Water Enterprise Environmental Stewardship Policy because it would provide for public access to the watershed in a manner compatible with natural resources management, water system operations and maintenance, fish and wildlife habitats, or habitat values. The project's proposed access program along the southern skyline ridge trail and access program variants 2 and 3, with mitigation, would also be consistent with most stewardship policy objectives. However, as discussed in Section 4.8, Biological Resources, increased public access under the proposed access program along the southern skyline ridge trail and variants 2 and 3 along both the Fifield-Cahill ridge trail and the southern skyline ridge trail could result in

[9] San Francisco Public Utilities Commission, *SFPUC Final Water Enterprise Environmental Stewardship Policy*. June 27, 2006.

[10] The purpose of the Watershed and Environmental Improvement Program is to identify, prioritize, protect, and restore lands and natural resources in the vicinity of the SFPUC's regional water system and includes ecosystem and habitat protection, improvement, and restoration projects.

accelerated dispersal of plant pathogens. Similarly, variants 2 and 3 along Fifield-Cahill ridge trail could result in substantial adverse effects on special-status butterflies, amphibians, and reptiles. As a result, unsupervised watershed access could constrain the management plan's goal of preserving and enhancing ecological resources in the watershed. Taken together, the project would not be inconsistent with the principal environmental stewardship policy objectives.

3.4.4 Right-of-Way Integrated Vegetation Management Policy

In February 2007, the SFPUC adopted the Right-of-Way Integrated Vegetation Management Policy to manage vegetation that poses a threat or hazard to the regional water system's operation, maintenance, and infrastructure throughout the SFPUC water distribution and collection systems. Fire danger within the SFPUC right-of-way is an issue under this management policy because the SFPUC is required to comply with local fire ordinances by identifying, reducing, and managing existing vegetation to prevent potential disruption to fire protection services. The vegetation management policy also aims to reduce and eliminate, to the degree practicable, the use of herbicides on vegetation within the right-of-way. Specific elements of the management policy address the management and removal of vegetation (including trees), annual grasses, and weeds within SFPUC rights-of-way and the management and removal of vegetation and trees on land leased or permitted by the SFPUC.[11]

Increased visitation within the watershed under the project could increase the potential for wildfires. However, as discussed in Section 4.11, Hazards and Hazardous Materials, the risk of increased wildfire would be reduced through the presence of docent guides (proposed access program along Fifield-Cahill ridge trail and variant 1), and establishment of a fire management plan (the proposed access program along the southern skyline ridge trail and variants 2 and 3). Further, as also noted in Section 4.11, with increased watershed visitation, trail operations and maintenance activities, including vegetation management, would increase commensurately. With either of these measures (i.e., docent or vegetation management plan), the project does not appear to be inconsistent with the integrated vegetation management policy.

3.5 State and Regional Agencies

3.5.1 California Department of Fish and Wildlife, Fish and Game Refuge Designation

In 1931, at the request of the SFPUC (then the San Francisco Water Department), the California Department of Fish and Wildlife (then the California Department of Fish and Game) designated the Peninsula Watershed as a state fish and game refuge under the control and enforcement of the division. Under section 10500 et seq. of the Fish and Game Code, the watershed is a designated refuge for both fish and game (birds and mammals), and the unauthorized "taking" of birds or mammals or the use of firearms (or other weapons for the purpose of taking birds or

[11] San Francisco Public Utilities Commission, *Right-of-Way Integrated Vegetation Management Policy*, Amended January 2015.

mammals) are generally prohibited in the Peninsula Watershed without specific authorization. However, section 10654 of the Fish and Game Code specifically states that none of the provisions of the refuge designation "prevents the full use of land included in the San Francisco Fish and Game Refuge for water supply purposes, nor prohibits any authorized employee of the San Francisco Water Department from carrying out such reasonable measures as might be necessary for the protection of the water supply or the prevention of pollution of the streams or reservoirs."

As discussed in Section 4.8, Biological Resources, the proposed access program and variant 1, with mitigation, would not result in the unauthorized taking of protected birds or mammals, or the use of firearms. Therefore, the proposed access program and variant 1 would not be inconsistent with the refuge designation.

However, variants 2 and 3, with mitigation, could conflict with the refuge designation. As identified in Section 4.8, Biological Resources, the taking of protected birds or mammals could result under variants 2 and 3, as noted below:

- Project operations with unsupervised visitor access along the Fifield-Cahill ridge trail would increase the potential for visitors, particularly bicyclists and equestrians, to encounter and harm the San Francisco garter snake and California red-legged frog, especially in the Five Points area. (Impact BI-5; access program variants 2 and 3)
- Project operations with unsupervised visitor access along the Fifield-Cahill ridge trail would increase the potential for direct impacts (e.g., trampling and crushing) on Mission blue butterfly or San Bruno elfin butterfly host plants, which could result in take of listed butterflies, including destruction of larvae and the permanent loss of occupied habitat. (Impact BI-5; access program variants 2 and 3)

Consistent with the refuge designation, variants 2 and 3 would not result in the use of firearms. As noted in Section 2.8, Intended Uses of the EIR and Approvals Required, various federal and/or state authorizations could be required if the project, under certain access programs, were to result in unavoidable take of a federally or state-listed special-status species. Thus, the SFPUC would be required to obtain certain environmental regulatory approvals for some access program configurations under which the take of a listed species could result, or otherwise further refine the project to avoid such impacts, prior to proceeding. If the federal and/or state agencies did not grant the required approvals, or the SFPUC didn't modify the project accordingly, the project could not proceed. Therefore, because the project would not result in unauthorized take, it would not conflict with state law or the refuge designation.

3.5.2 Bay Area Air Quality Management District, Bay Area 2017 Clean Air Plan

The Bay Area 2017 Clean Air Plan[12] is focused on specific goals for the protection of air quality, public health, and the climate. The Bay Area Air Quality Management District, the State of California, and the U.S. Environmental Protection Agency have developed performance

[12] Bay Area Air Quality Management District, *2017 Clean Air Plan, Spare the Air, Cool the Climate, 2017, http://www.baaqmd.gov/*.

objectives and air quality attainment standards aimed at achieving these goals. The clean air plan includes a wide range of proposed control measures, which consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent greenhouse gases. The San Francisco Bay Air Quality Air Basin is designated non-attainment by the California Air Resources Board for both the one- and eight-hour state ozone standards. In addition, emissions of ozone precursors in the air basin contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the clean air plan to include all feasible measures to reduce emissions of ozone precursors and reduce the transport of ozone precursors to neighboring air basins.

As discussed in sections 4.6 and 4.7, Air Quality and Greenhouse Gases, respectively, project construction and operations would generate emissions of criteria air pollutants and greenhouse gases. SFPUC would reduce these impacts by complying with applicable air quality regulations and plans, and implementing mitigation measures. Therefore, the project would not be inconsistent with the clean air plan.

3.5.3 Regional Water Quality Control Board, Water Quality Control Plan for the San Francisco Bay Basin

The Water Quality Control Plan for the San Francisco Bay Basin (basin plan) is the regional board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the state, including surface waters and groundwater, and includes implementation programs to achieve water quality objectives. The water bodies in the Peninsula Watershed including the Pilarcitos, San Andreas, and Upper and Lower Crystal Springs reservoirs, as well as the Pilarcitos and San Mateo creeks, identified in **Table 3-1**.

TABLE 3-1
DESIGNATED BENEFICIAL USES

Water Body	Designated Beneficial Uses
Upper Crystal Springs Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Lower Crystal Springs Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Pilarcitos Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
San Andreas Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Pilarcitos Creek	AGR, MUN, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
San Mateo Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2

Beneficial Uses Key:

AGR (Agricultural Supply)
MUN (Municipal and Domestic Supply)
FRSH (Freshwater Replenishment)
COLD (Cold Freshwater Habitat)
MIGR (Fish Migration)
RARE (Preservation of Rare and Endangered Species)
SPWN (Fish Spawning)
WARM (Warm Water Freshwater Habitat)
WILD (Wildlife Habitat)
REC-1 (Body Contact Recreation)
REC-2 (Noncontact Recreation)

* Water contact recreation is prohibited in the reservoirs to protect public health, but the basin plan water quality objectives for water contact recreation apply.

SOURCE: Regional Water Quality Control Board, 2017.

As discussed in Section 4.10, Hydrology and Water Quality, through compliance with applicable regulations, the proposed access program along the Fifield-Cahill ridge trail and variant 1 would not result in water quality impacts that would conflict with the basin plan's beneficial uses or water quality objectives. Similarly, under the proposed access program along the southern skyline ridge trail and variants 2 and 3, with adherence to applicable regulations and mitigation to protect against direct effects on a seasonal drainage in the project area, the project would not result in any such inconsistencies with the basin plan's beneficial uses or water quality objectives.

3.6 San Mateo County Land Use Plans and Policies

The project is located entirely on extraterritorial lands owned by San Francisco in unincorporated San Mateo County. This section describes the local land use policies of San Mateo County that are relevant to the project. The SFPUC is not legally bound by the land use plans and policies of San Mateo County. However, the SFPUC seeks to work cooperatively with local jurisdictions where San Francisco-owned facilities are sited outside of San Francisco, and this EIR evaluates the project's consistency with San Mateo County plans and policies to the extent required under CEQA.

3.6.1 San Mateo County General Plan

The San Mateo County General Plan governs land use planning and development in unincorporated San Mateo County, which encompasses over 30,000 acres of urban, rural, and permanent open space. The general plan seeks to balance the different land use patterns, infrastructure needs, and circulation patterns of these various land uses while acknowledging the need to preserve San Mateo County's open space, natural resources, and agricultural lands.

The general plan contains 16 elements that guide open space and rural and urban land management and development within the county. The general plan supports the preservation of natural resources, including biological, historic, and visual resources. Specific goals of the general plan promote a measured approach to natural, cultural, and recreational resource management by encouraging cooperative efforts among all agencies with jurisdiction in San Mateo County to coordinate the management, enhancement, and protection of the county's resources.[13]

The list below describes aspects of the San Mateo County General Plan as they relate to the project:

- **Local Agency Project Approval.** The project would not require a permit from San Mateo County.
- **Building and Zoning Ordinances.** Building and zoning ordinances are the most specific expressions of general plan goals, objectives, and policies. State law and judicial interpretations of state law (California Government Code section 53090 et seq.) mutually exempt cities and counties from complying with each other's building and zoning ordinances. The SFPUC, which is part of the City and County of San Francisco, is therefore exempt from complying with the building and zoning ordinances of other cities and counties (California Government Code

[13] County of San Mateo, *General Plan*. Approved November 18, 1986.

section 53091). Therefore, the facilities and improvements proposed under the project are not subject to the building and zoning ordinances of San Mateo County.

- **Local Government Notification and Consistency Determination Requirements.** California Government Code section 65402(b) requires that the SFPUC inform cities and counties of its plans to construct projects or acquire or dispose of extraterritorial property within their jurisdictions. The local governments then have 40 days to determine whether the project is consistent with their general plans, although these consistency determinations are advisory to the SFPUC rather than binding. Prior to implementation of the project, SFPUC would notify San Mateo County pursuant to California Government Code section 65402(b). Notwithstanding the above, where San Francisco-owned facilities are sited outside of San Francisco, the SFPUC seeks to work cooperatively with local jurisdictions to avoid conflicts with local land use plans and building and zoning codes.

In addition, the following are examples of specific significance criteria under CEQA that require an analysis of the compatibility of a proposed project with certain aspects of local land use plans and policies adopted to avoid or mitigate an environmental effect if the project were to:

- Result in the loss of availability of a locally important mineral resource recovery site delineated in a local general plan, specific plan, or other land use plan (not applicable, see Section 4.12, Topics Not Requiring Detailed Environmental Analysis);
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (analyzed in Section 4.8, Biological Resources);
- Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (analyzed in Section 4.5, Noise);
- For a project located within an area covered by 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), expose people residing or working in the project area to excessive noise levels (not applicable, see Section 4.5, Noise); or
- Conflict with existing zoning for agricultural use or a Williamson Act contract (not applicable, see Section 4.12, Topics Not Requiring Detailed Environmental Analysis).

The San Mateo County General Plan designates scenic routes near the project area, including Cañada Road, Half Moon Bay Road (State Route 92), and Skyline Boulevard (from San Francisco to Half Moon Bay Road). Section 4.2, Aesthetics, addresses each of these scenic routes and their relationship to the project area in detail.

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CHAPTER 4

Environmental Setting, Impacts, and Mitigation Measures

4.1 Overview

Chapter 4 presents the project-level physical environmental effects analysis for the Southern Skyline Boulevard Ridge Trail Extension Project ("project"), as described in Chapter 2, Project Description. This section presents the structure used in the individual environmental topic sections in this chapter as well as the basic assumptions used in the impact analyses, including the scope of analysis, the baseline conditions used to analyze impacts, the categories of impact significance, and the assumptions for the cumulative impact analyses. As discussed further below, for each environmental topic identified in Section 4.1.1, Scope of Analysis, the environmental setting is described, the impacts of the project on that resource topic are analyzed, and mitigation measures are recommended where necessary to address potentially significant impacts.

The Peninsula Watershed Management Plan Environmental Impact Report (EIR) examines the environmental effects of new recreational trails and amenities, along with a range of public access program options for watershed trails. The analysis considers many of the components of the project, albeit at a more general, or program level of analysis. Where relevant, this EIR relies upon information and analysis from the management plan EIR. Where appropriate, for each environmental topic considered, this EIR updates or supplements the setting and impact analysis with additional site-specific information and project-level design details that have become available since management plan EIR certification.[1]

4.1.1 Scope of Analysis

Since certification of the management plan EIR, the San Francisco Public Utilities Commission (SFPUC) has developed a more detailed proposal for the project that allows for a more thorough review of the project's potential impacts. Sections 4.2 through 4.12 address environmental resources that the management plan EIR, or subsequent project-level analysis as part of this EIR, found could be significantly affected by the project components. Conversely, Section 4.13, Topics Not Requiring Detailed Environmental Analysis, addresses environmental resources that the

[1] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343*, accessed May 18, 2018.

management plan EIR and this EIR found would not be significantly affected by project. Accordingly, this chapter is organized into 13 sections, as shown in the table below.

Sections	
4.1 Overview	4.8 Biological Resources
4.2 Aesthetics	4.9 Geology, Soils, and Paleontological Resources
4.3 Cultural Resources	4.10 Hydrology and Water Quality
4.4 Transportation and Circulation	4.11 Hazards and Hazardous Materials
4.5 Noise and Vibration	4.12 Tribal Cultural Resources
4.6 Air Quality	4.13 Topics Not Requiring Detailed Environmental Analysis
4.7 Greenhouse Gas Emissions	

Each environmental resource section in this chapter contains the following elements, which are based on the requirements of the California Environmental Quality Act (CEQA):

- **Introduction** – presents an overview of the environmental topics evaluated; references to other topical sections that might discuss related topics; explanation of how the section tiers from the management plan EIR; and a summary of scoping comments received from the issuance of the notice of preparation, including the location in the section where the comments are addressed.

- **Environmental Setting** – describes the existing physical environmental conditions in the vicinity of the project at an appropriate level of detail to allow the reader to understand the impact analysis for each resource topic.

- **Regulatory Framework** – describes the relevant laws and regulations that apply to protecting the environmental resources within the project area, and the governmental agencies responsible for enforcing those laws and regulations.

- **Impacts and Mitigation Measures** – evaluates the potential for the project to adversely affect the physical environment described in the environmental setting subsection. The significance criteria used in this EIR are based on the San Francisco Planning Department's September 2017 Initial Study checklist, which is based on CEQA Guidelines Appendix G.

  The State Office of Planning and Research issued new CEQA Guidelines, including the Appendix G environmental checklist form, effective on December 28, 2018. The refinements and updates make efficiency, substantive, and technical improvements, and take into account CEQA legislation, case law, other state environmental laws and regulations, and feedback from public agencies, business and environmental groups, and other stakeholders. Substantive changes include provisions to implement Senate Bill 743 of 2013 and to focus transportation analysis on vehicle miles traveled (rather than intersection and roadway level of service); the addition of new Appendix G environmental topics on energy and wildfires; updated exemptions for transit-centered residential and mixed-use development; use of regulatory standards as thresholds of significance; and allowing the use of other baselines to describe existing conditions when supported by appropriate evidence. The CEQA checklist revisions focus primarily on the scope of the analysis and do not substantively expand it, other than the new wildfire questions. The new energy questions are similar to the previous

Appendix F, which concerned energy conservation and the avoidance of inefficient, wasteful, and unnecessary consumption of energy.

The planning department recognized that a number of environmental documents were in various stages of review and determined that those that had completed, or had reasonably advanced towards, the second administrative draft could use the prior CEQA Guidelines. Although the city has allowed the use of the earlier Appendix G, the analysis in this EIR does consider substantive changes included in the new guidelines. For example, the analysis focuses on the effects of the project on the existing physical environment (rather than the impacts of the environment on the project, as clarified in California Building Industry Association v. Bay Area Air Quality Management District [2015] 62 Cal.4th 369); and addresses wildfire hazards given the high potential for forest fires in the project area (presented in the Hazards and Hazardous Materials section); and considers transportation impacts in terms of vehicle miles traveled, rather than intersection and roadway level of service.

At the beginning of each impact analysis subsection, the Appendix G criteria, which are used to evaluate environmental impacts, are defined, followed by an explanation of how the analysis applied significance criteria in evaluating project impacts. Each impact analysis conclusion is expressed in terms of impact significance. Section 4.1.3, Categories of Impact Significance, presents definitions of the categories of impact significance.

This subsection also identifies mitigation measures for all significant impacts, consistent with the CEQA Guidelines (section 15126.4[a][1]), which state that an EIR, "shall describe feasible measures which could minimize significant adverse impacts…." This EIR assigns each impact section a unique alphanumeric identifier that is comprised of that resource section's abbreviation and a number, with all impacts for that resource topic sequentially numbered. For example, the abbreviation "CU" indicates cultural resources impacts; the first cultural resource impact is Impact CU-1 and the second cultural resources impact is Impact CU-2, etc. The mitigation measure(s) that correspond with the impact are identified with a "M" in front of the same alphanumeric code. For example, Mitigation Measure M-CU-1 addresses Impact CU-1.

- **Cumulative Impacts and Mitigation Measures.** Each environmental resource section discusses cumulative impacts immediately following the project-level impact analysis. The analysis of cumulative impacts considers the effects of the project together with those of other past, present, or reasonably foreseeable future projects proposed by the SFPUC or other entities. This EIR presents an evaluation of cumulative impacts for each environmental topic based on the same setting, regulatory framework, and significance criteria as the project-level impacts. Additional mitigation measures are identified if the analysis determines that the project's contribution to a cumulative impact is "cumulatively considerable" and therefore significant. Cumulative impacts are designated with a "C" in front of the code corresponding to the subject environmental topic; for example, the cumulative cultural resources impact is designated Impact C-AE. See Section 4.1.4, Cumulative Impact Analysis, below, for further discussion of the approach to the cumulative impact analyses.

- **Impacts of Mitigation Measures.** CEQA Guidelines section 15126.4 states that "if a mitigation measure would cause one or more significant effect in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed but in less detail than the significant effects of the project as proposed."

  This chapter identifies mitigation measures for all potentially significant impacts. In most cases, implementing the mitigation measure would reduce or avoid the magnitude, duration,

and/or severity of the identified impact with no additional secondary effects. However, as discussed in Impact HZ-8 of Section 4.11, Hazards and Hazardous Materials, implementation of Mitigation Measure M-HZ-8, Fire Management Plan, could result in other environmental impacts in addition to those that would be caused by the project. Therefore, this EIR explains how the additional significant effects caused by the mitigation measure would or would not change the overall impact conclusion(s). In this case, implementation of the full suite of project mitigation measures would reduce or avoid the impacts of all mitigation measures.

4.1.2 Baseline Conditions for Evaluating Project Impacts

The CEQA Guidelines section 15125 provides that, in most cases, the environmental conditions at the time of publication of the notice of preparation constitute the appropriate baseline physical conditions by which the lead agency should evaluate project impacts. The environmental setting subsection of each environmental resource section of this chapter describes the baseline conditions for the project. The impact analysis identifies the conditions that are expected to occur with implementation of the project and compares those conditions against the baseline conditions to determine whether the project would result in a significant environmental impact. The impact significance determinations are based on the significance criteria identified for each resource topic.

4.1.3 Categories of Impact Significance

The categories designated for the different levels of impact significance used in this EIR are listed below.

- **No Impact.** No adverse changes (or impacts) to the environment are expected.
- **Less than Significant.** An impact that would not involve an adverse physical change to the environment, does not exceed the defined significance criteria, or would be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations.
- **Less than Significant with Mitigation.** An impact that would be reduced to a less-than-significant level though implementing the identified mitigation measure.
- **Significant and Unavoidable with Mitigation.** An adverse physical environmental impact that would exceed the defined significance criteria and could be reduced through compliance with existing local, state, and federal laws and regulations and/or implementing all feasible mitigation measures, but could not be reduced to a less-than-significant level.
- **Significant and Unavoidable.** An adverse physical environmental impact that would exceed the defined significance criteria and could not be eliminated or reduced to a less-than-significant level through compliance with existing local, state, and federal laws and regulations and for which there are no feasible mitigation measures.

In situations where the potential exists for an impact to occur, but not enough information (either project- or site-specific) is available to determine definitively whether a significant impact would occur, this EIR conservatively assumes the impact would be significant.

4.1.4 Cumulative Impact Analysis

CEQA defines cumulative impacts as "two or more individual effects, which, when considered together, are considerable, or which can compound or increase other environmental impacts." section 15130 of the CEQA Guidelines requires that an EIR evaluate potential environmental impacts that might be individually limited but cumulatively significant. These impacts could result from the project alone, or together with other projects. The CEQA Guidelines state: "The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects." Cumulative impacts could result from individually minor but collectively significant projects taking place over time.

CEQA Guidelines section 15130(b)(1) provides two approaches to a cumulative impact analysis. Cumulative impacts can be determined based on: (1) a list of past, present, and probable future projects producing related or cumulative impacts, or (2) a summary of projections contained in a general plan or related planning document or in an adopted or certified environmental document that described or evaluated regional or area-wide conditions contributing to the cumulative impact. This cumulative analysis employs the list-based approach. The following factors were used to determine an appropriate list of cumulative projects to be considered:

- **Similar Environmental Impacts.** Projects that are relevant to the cumulative analysis include those that could contribute incremental effects on the same environmental resources and would have similar environmental impacts to those discussed in this EIR. The cumulative impact analyses in each section of this chapter evaluate the cumulative impacts that could occur when the impacts of the project are considered in combination with the impacts of other past, present, and reasonably foreseeable future projects, which have been or are subject to independent environmental review and consideration by the approving agencies. Consequently, it is possible that some of the reasonably foreseeable future projects will not be approved or will be modified prior to approval. For the purpose of providing a conservative assessment of cumulative impacts, however, this cumulative impact analysis is premised on the approval and construction of all of the identified reasonably foreseeable projects, as described in Table 4.1-1.

- **Geographic Scope and Location.** The geographic scope for the cumulative projects is described in each topical section of this chapter and is specific to the potentially affected resource. In general, the geographic scope includes the areas within and adjacent to the project area. However, the geographic scope for some resource topics can encompass a larger area, such as the greater Peninsula Watershed for hydrological impacts, the regional roadway network for transportation impacts, or the regional air basin for air quality impacts.

- **Timing and Duration of Implementation.** Construction of the project would span 12 months and is anticipated to commence in summer 2020 (refer to Section 2.6.10, Construction Equipment, in Chapter 2, Project Description) and be completed in summer 2021. For temporal impacts such as noise and traffic, cumulative effects from other projects are considered if the planned construction of those projects could overlap with project construction or could occur immediately prior to or after construction of the project and would affect the same environmental resources. Cumulative effects related to project operations are also considered if operation of the project would affect the same resources as operation of other projects within the geographic scope of the cumulative impact.

A cumulative impact analysis for the individual resource topics is provided in each section of this chapter, immediately following the evaluation of direct project impacts and identified mitigation measures.

4.1.4.1 List of Relevant Projects

Table 4.1-1 includes the past, present, and reasonably foreseeable projects and activities within and near the project area that would potentially contribute to cumulative impacts when considered together with the project, as well as projects that could change future conditions in the project vicinity. Figure 4.1-1 shows the general location of the cumulative projects.

The list of projects was developed through review of available information on the San Mateo County Planning and Building Department and the San Francisco Planning Department websites, and via contact with planning personnel at each agency, among others. The information reviewed includes the following:

- San Francisco Planning Department, Pacific Gas and Electric (PG&E) Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project, Final Mitigated Negative Declaration, San Francisco Planning Department Case No. 2013.1761E, 2016

- California Department of Transportation (Caltrans), State Route 92 (S.R. 92) Passing Lane/Climbing Lane. Email communication, Rob Bartoli, County of San Mateo; Connect the Coastside, San Mateo County, 2016

- San Mateo County Planning and Building Department, S.R. 92/State Route 35 (S.R. 35) Roundabout. Email communication, Rob Bartoli, County of San Mateo; Connect the Coastside, San Mateo County, 2016

- San Mateo County Planning and Building Department, S.R. 92 Bike Lanes. Email communication, Rob Bartoli, County of San Mateo; Connect the Coastside, San Mateo County, 2016

- San Mateo County Public Works Department, Lower Crystal Springs Dam Bridge Replacement Project. *http://publicworks.smcgov.org/crystal-springs-dam-bridge-replacement-project*. Accessed May 31, 2018

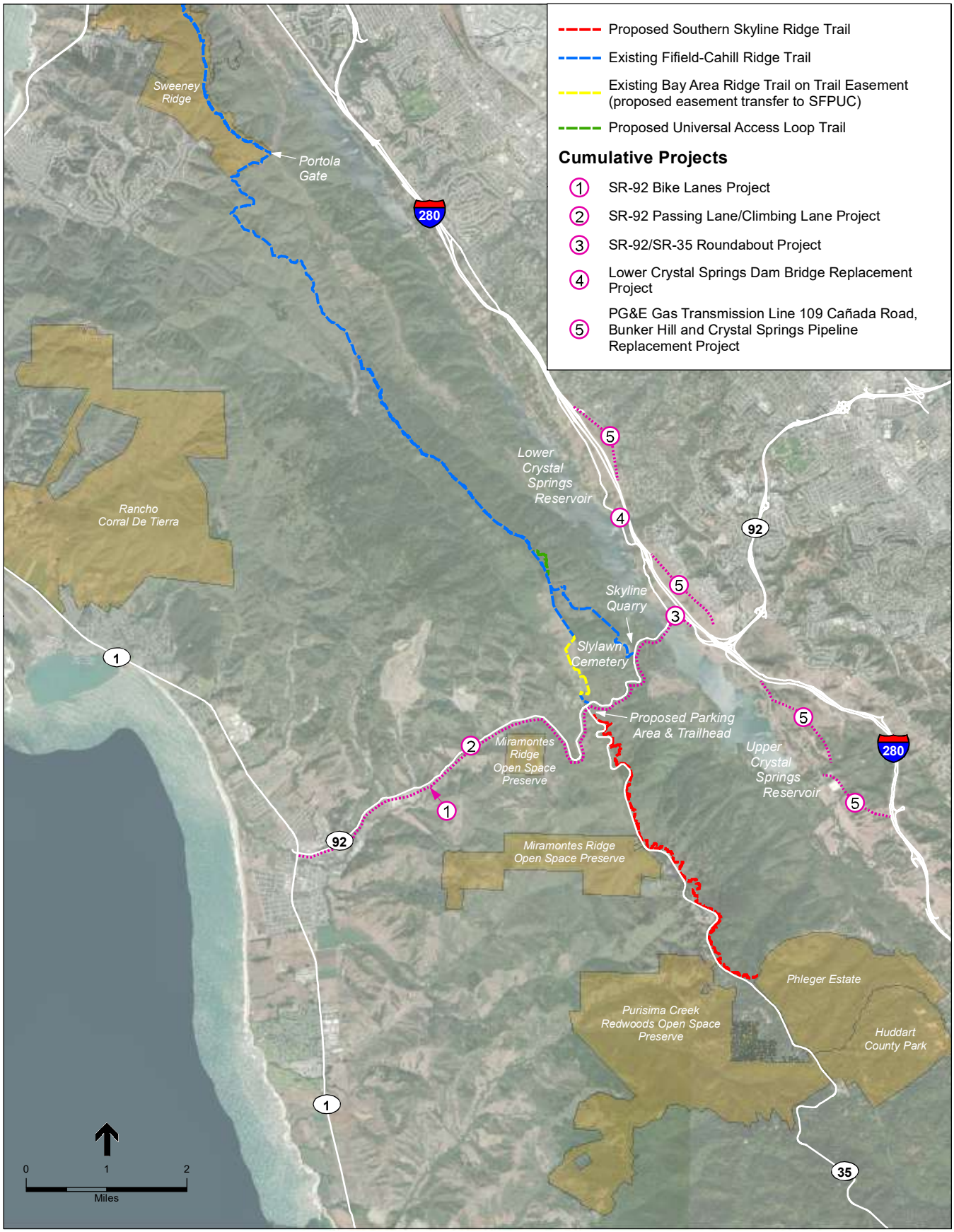
- San Mateo County Parks Department, Complete the Gap Trail Project. *https://parks.smcgov.org/complete-gap-trail-project.* Accessed May 31, 2018

TABLE 4.1-1
PROJECTS CONSIDERED IN THE CUMULATIVE IMPACT ANALYSIS

Project No.	Project Name (Jurisdiction)	Project Description	Potential Cumulative Topics	Geographic Overlap / Construction Schedule Overlap with the Project	Estimated Construction Schedule
1	S.R. 92 Bike Lanes (Caltrans)[a]	This project will provide Class II bicycle lanes along segments of S.R. 92 between Half Moon Bay and San Mateo to enhance bicyclist safety.	Cumulative construction impacts for traffic and circulation.	Project construction would occur on roads that could be used by construction vehicles.	Unknown
2	S.R. 92 Passing Lane/Climbing Lane (Caltrans)[b]	This project will provide passing/climbing lanes on the eastbound portion of the S.R. 92 between the Landfill Road and Pilarcitos Quarry Road to allow cars to pass the high volume of trucks on this roadway segment as well as provide a passing lane to go around right-turning cars.	Cumulative construction impacts for traffic and circulation	Project construction would occur on roadways that could be used by construction vehicles	Unknown
3	S.R. 92/S.R. 35 Roundabout (Caltrans)[c]	This project will install a 130-foot roundabout at the intersection of S.R. 92 and northbound S.R. 35, on the eastern side of Crystal Springs Reservoir.	Cumulative construction impacts for traffic and circulation and hydrology and water quality.	Project construction would occur in the Peninsula Watershed and on roadways that could be used by construction vehicles.	Unknown
4	Lower Crystal Springs Dam Bridge Replacement Project (County of San Mateo, Department of Public Works)[d]	The project involved construction of a new 626-foot long by 51.5-foot-wide cast-in-place, post-tensioned concrete girder replacement bridge on top of the Lower Crystal Springs Dam. A new trail section ("Complete the Gap Trail Project") was installed south of the bridge that allows trail users to continue along the Crystal Springs Regional Trail to the "South of Dam" trail section.	Cumulative operational impacts for biological resources and hydrology and water quality.	Project is in the Peninsula Watershed.	Completed December 2018[e]
5	PG&E, Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project (City and County of San Francisco) [f]	The project provides for the replacement of approximately 4.7 miles of existing underground natural gas pipeline across SFPUC Peninsula Watershed lands within San Mateo County. The project includes pipeline improvements to the Cañada Road, Bunker Hill, and Crystal Springs segments. Pipeline replacement would occur in place, adjacent and parallel to the existing pipeline, or offset to avoid affecting biological resources, depending upon the alignment. Installation methods would range from cut-and-cover open trench construction to horizontal directional drilling in certain locations.	Cumulative construction and operational impacts on biological resources.	Project is in the Peninsula Watershed.	Construction completed December 2018

NOTES:

[a] San Mateo County, Planning Cost Estimate, S.R. 92 Bike Lanes. February 19, 2015.
[b] San Mateo County, Planning Cost Estimate, S.R. 92 Passing/Climbing Lanes. February 9, 2015.
[c] San Mateo County, Planning Cost Estimate, S.R.92/SR-35 Roundabout. February 9, 2015.
[d] San Mateo County, Department of Public Works, Crystal Springs Dam Bridge Replacement Project, 2018, *https://publicworks.smcgov.org/projects/crystal-springs-dam-bridge-replacement-project*, accessed May 31, 2018.
[e] Herzberg, Samuel, Senior Planner, County of San Mateo Parks Department, telephone conversation with Tina Will, Senior Technical Expert, Environmental Science Associates, January 14, 2019.
[f] San Francisco Planning Department, Final Mitigated Negative Declaration, PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project San Mateo County. May 2, 2016.



SOURCE: ESA+Orion; ESRI Imagery

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.1-1
Cumulative Projects

4.2 Aesthetics

This section describes the existing aesthetic environment in the project area and identifies the potential aesthetic resources impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses the potential effects from construction and operation of the project under the proposed access program (docent program along the Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). This impact evaluation considers effects on scenic areas, public view corridors, and views from designated scenic roads.

Of the comments received during the public scoping period, comments on the topic of visual effects generally concern the project's potential impacts on the Golden Gate National Recreation Area's two easements—the scenic easement and the scenic and recreation easement. Chapter 3, Plans and Policies, and Sections 4.2.3, Impacts and Mitigation Measures, discuss these easements.

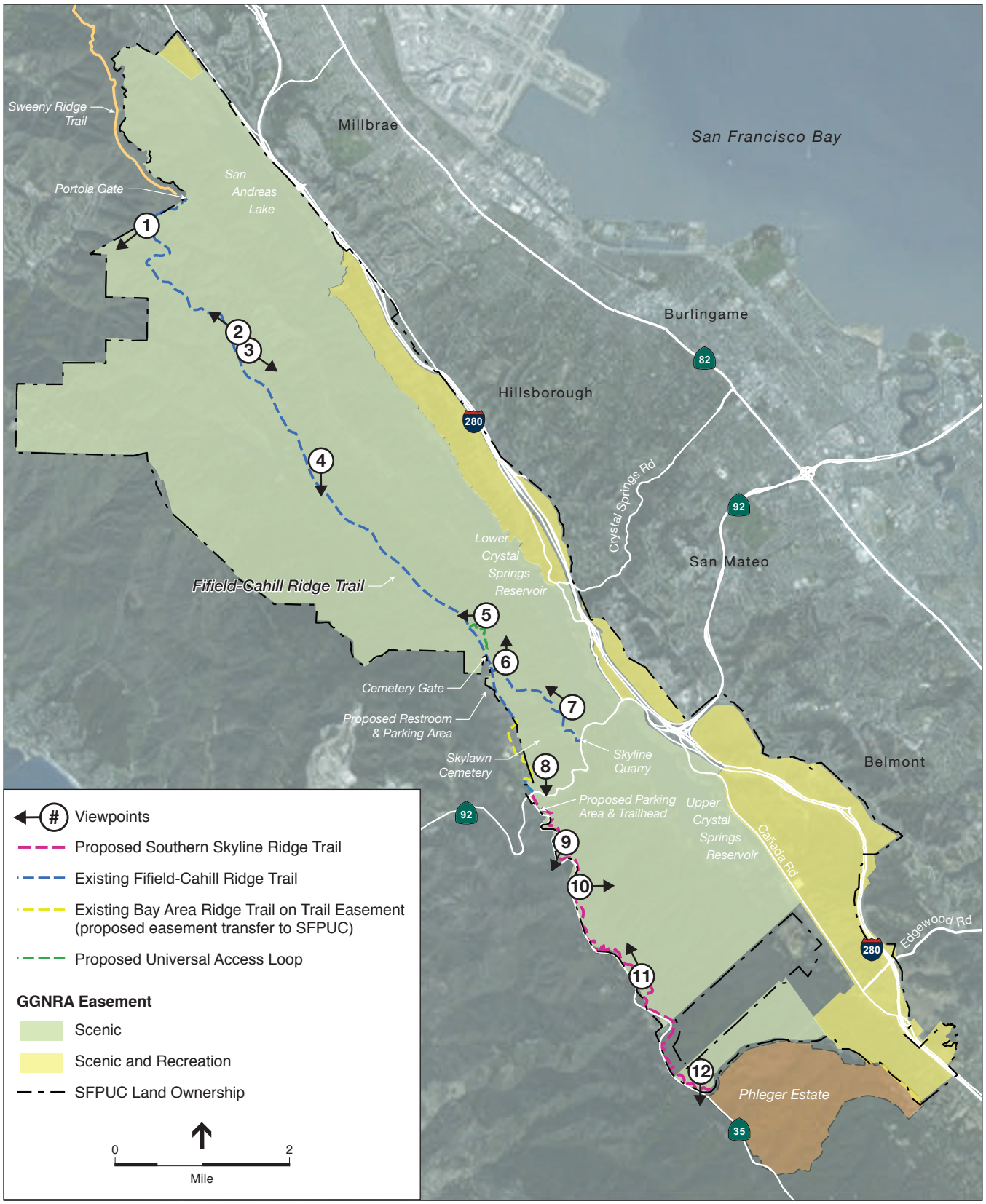
4.2.1 Environmental Setting

This discussion defines key terms used in the aesthetics evaluation. For the purpose of this evaluation, the physical setting encompasses any area in the project vicinity from which there are scenic views that could be affected by the project. The project lies entirely within the geographic scope of the aesthetic resources setting characterized in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR). This section summarizes the relevant information from the management plan EIR that remains valid and incorporates it by reference.

As noted in the management plan EIR, the Peninsula Watershed covers more than 23,000 acres of the San Francisco Peninsula, encompassing lands on the east-facing slope of the Peninsula, between State Route 35 (S.R. 35)[1] and Interstate 280 (I-280). Land uses near the watershed are predominantly residential developments to the north and east, the mostly undeveloped wooded Santa Cruz Mountains to the south, and I-280 to the east. In addition, State Route 92 (S.R. 92) bisects the watershed between Upper and Lower Crystal Springs reservoirs. Figure 4.2-1 presents a viewpoint map that identifies the locations and directions from which the Draft EIR's analysts took photographs (identified by number). Figures 4.2-2a through Figure 4.2-2c present representative photographs as a single group.

This section describes the project area in terms of its scenic vistas, scenic resources, and visual character and presents key elements of these features. As discussed in Section 4.2.3.2, Approach to Analysis, these concepts and the resources they represent serve as the bases for the impact analysis.

[1] S.R. 35 is also Skyline Boulevard in this location.



SOURCE: ESA+Orion; Google Earth

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.2-1

Representative Viewpoints and Features of Interest

Photo 1 - Southwestern view from Fifield-Cahill Ridge Trail towards Pacifica

Photo 2 - Northwestern view from Fifield-Cahill Ridge Trail towards meadow and distant chaparral

Photo 3 - Southeastern view from Fifield-Cahill Ridge Trail towards meadow and distant chaparral

Photo 4 - Southern view from Fifield-Cahill Ridge Trail towards Douglas fir forest

SOURCE: ESA+Orion

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.2-2a

Representative Photographs of the Project Area

Photo 5 - Western view from Loop Trail towards water tank and Fifield-Cahill Ridge Trail

Photo 6 - Northern view from Cahill Ridge Road (existing trail from Skyline Quarry to Cemetery Gate) towards Cemetery Gate and Fifield-Cahill Ridge Trail

Photo 7 - Northwestern view from Skyline Quarry towards Cahill Ridge Road (existing trail from Skyline Quarry to Cemetery Gate)

Photo 8 - Southern view from Skylawn Memorial Park towards Southern Skyline Ridge Trail Alignment and Skyline Boulevard

SOURCE: ESA+Orion

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.2-2b

Representative Photographs of the Project Area (cont.)

Photo 9 - Southwestern view from Skyline Boulevard turn-out towards Southern Skyline Ridge Trail alignment

Photo 10 - Eastern view from Skyline Boulevard towards Southern Skyline Ridge Trail and eucalyptus forest

Photo 11 - Northwestern view from SSBRTE access drive towards Southern Skyline Ridge Trail alignment and Skyline Boulevard

Photo 12 - Southern view from Southern Skyline Ridge Trail alignment towards existing residence

SOURCE: ESA+Orion

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.2-2c

Representative Photographs of the Project Area (cont.)

Scenic Vistas. The management plan EIR identifies several locations from which people can view scenic vistas (vista points) in the project vicinity, including along I-280, from S.R. 35 at Crystal Springs Road, and from the Sweeney Ridge Trail, among others.[2] However, because of the project's location within the watershed, coupled with the area's intervening topography and vegetation, there are not many vista points from which the project area is visible. Scenic vistas are available from the Caltrans vista point at the intersection of S.R. 92 and S.R. 35 and from the Sweeney Ridge Trail at Portola Gate. In addition, people traveling along the Fifield-Cahill ridge trail are afforded several scenic vistas; however, access to these vista points is generally restricted to watershed visitors under the existing docent program.

Scenic Resources. Within the project area, scenic resources include the area's rolling ridge-top topography flanked by steeply sloping hillsides, in addition to diverse assemblages of mostly intact vegetation communities, including open meadows, dense patches of coastal scrub, and tall stands of mature Douglas fir and redwood forests. Other defining scenic resources visible from the project area include the Pacific Coast to the west and San Francisco Bay to the east, along with the region's distant hills and urban communities.

Visual Character. The Fifield-Cahill ridge trail and proposed universal access loop trail alignment generally follow the rolling ridgeline hills, passing through open meadows, dense stands of northern coastal scrub, and Douglas fir forest (see Figures 4.2-2a and 4.2-2b, photos 1 through 7). The proposed southern skyline ridge trail alignment extends along the east-facing slope of Skyline Ridge, meandering through northern coastal scrub and Douglas fir forest in the north; a broad, vegetated fuel break in the middle; and mature stands of mixed evergreen and redwood forests in the south. At various locations along the existing and proposed trail alignments, dense vegetation gives way to clearings with sweeping scenic vistas (see Figures 4.2-2b and 4.2-2c, photos 8 through 12).

The existing and proposed trail alignments pass through mostly undeveloped portions of the watershed. However, varying degrees of human development and management activities are evident from certain locations. Along the Fifield-Cahill ridge trail, development consists of paved and unpaved roads, gates and various fencing (e.g., chain link, barbed wire, and split rail) in limited locations, restrooms and other small utility structures (e.g., water tanks and enclosures), and the landscaped grounds of the Skylawn Memorial Park and appurtenant facilities at the trail's south end. Development along the southern skyline ridge trail alignment includes the Caltrans vista point parking lot, S.R. 35, a rarely used SFPUC roadbed, intermittent segments of barbed-wire fencing and access gates, overhead utility lines, and a small number of private residences.

The SFPUC performs ongoing maintenance and management of Peninsula Watershed facilities and lands. These activities both decrease the naturalistic character of the project area and increase opportunities for expansive views. Current watershed management and maintenance periodically requires the presence of maintenance vehicles, equipment, and materials along with earth movement and vegetation management. For example, the SFPUC mows and maintains (i.e., grades and/or patches) watershed roads, including portions of the Fifield-Cahill ridge trail, every

[2] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-3 to III.I-8), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

two to five years. In addition, SFPUC staff manages wildfire risk by reducing fuel loads and maintaining fuel breaks of up to 50 feet wide throughout the watershed, including along the southern skyline ridge trail alignment and along Fifield Ridge, north of Five Points. This work involves tree felling and vegetation clearing, as needed, typically on four-year intervals.[3,4] As described more fully in Section 4.8, Biological Resources, plant pathogens in the watershed—including sudden oak death (*Phytophthora ramorum*)—have decimated stands of coast live oak and tanoak within portions of the project area. In the course of, and in addition to, regular fuel maintenance activities, SFPUC staff has worked to slow the spread of sudden oak death and minimize the risk to public health and safety by removing hundreds of infected trees, among other measures.

4.2.2 Regulatory Framework

4.2.2.1 Federal Regulations

There are no federal regulations pertaining to aesthetic resources that apply to this project.

4.2.2.2 State Regulations

California Scenic Highway Program

In 1963, the California legislature created the Scenic Highway Program to protect scenic highway corridors from changes that would diminish the aesthetic value of lands abutting highways. The state regulations and guidelines governing the Scenic Highway Program are found in the Streets and Highways Code, section 260 et seq. A highway may be designated as "scenic" depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the travelers' enjoyment of the view. Within the project area, Caltrans has officially designated S.R. 35 (from S.R. 92 to the Santa Cruz County line) and I-280 (from Sneath Lane in San Bruno to the Santa Clara County line) as State Scenic Highways.[5] The management plan EIR[6] describes each of these scenic roads and associated scenic landscapes, and Figure 4.2-1 shows these scenic roads. As described in the management plan EIR, views of the project area from these highways and nearby vista points are "extremely limited" due to distance and intervening topography and vegetation.[7]

3 San Francisco Public Utilities Commission, *Peninsula Fuel Management Units*, March 26, 2012. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

4 John Fournet, Community Liaison, SFPUC, Vegetation maintenance along Fifield-Cahill ridge trail (file note), May 12, 2017.

5 Caltrans, Officially Designated State Scenic Highways and Historic Parkways, September 7, 2011, *http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways*, accessed April 15, 2019.

6 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-3 to III.I-6).

7 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (p. III.I-6).

4.2.2.3 Local Regulations

San Mateo County Designated Scenic Routes

The San Mateo County General Plan's Visual Quality Policies identify scenic roads and corridors and associated development regulations. Such County-designated scenic routes from which the project area could potentially be visible include Cañada Road, Half Moon Bay Road (S.R. 92), and S.R. 35 (from San Francisco to Half Moon Bay Road). The management plan EIR describes these scenic routes and the views they provide toward the project area,[8] as shown in Figure 4.2-1. However, visibility of the project area is limited from these scenic routes for the reasons described above (i.e., distance and intervening topography and vegetation).

4.2.3 Impacts and Mitigation Measures

4.2.3.1 Significance Criteria

The project would have a significant impact related to visual resources if it were to:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and other features of the built or natural environment that contribute to a scenic public setting;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area or substantially affect other people or properties.

Due to the nature of the project, there would be no temporary or permanent impacts associated with light and glare during construction and operation for the reasons described below:

Project construction would not create a temporary or permanent source of substantial light or glare. The management plan EIR considers the potential light and glare impacts from new facilities. For projects that would cause substantial sources of light or glare, the management plan EIR recommends Program-Level Mitigation Measure I.1, which calls for avoidance of reflective materials and implementation of lighting controls.[9] As indicated in Section 2.6.12, Construction Schedule, of Chapter 2, Project Description, proposed construction activities would generally occur Monday through Friday between 7 a.m. and 6 p.m., and Saturday between 9 a.m. and 5 p.m. Since nighttime construction is not proposed, no nighttime lighting would be required. In addition, the construction contractor would not use equipment and materials with large, highly reflective surfaces. Thus, there would be no impact related to creating a temporary source of light or glare.

As discussed in Section 2.5.1, Trail Improvements and Expansions, of Chapter 2, Project Description, the project would not involve any new sources of lighting. As also discussed in that section, project components would generally consist of non-reflective materials such as

[8] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-5 to III.I.6).

[9] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-12 to III.I-13); Section V.I, Aesthetics (p. V-37).

wood and stone. The restroom facilities are the only proposed vertical structures with notable vertical surface area. These facilities would be small (i.e., 130 square feet each), sited in remote locations, screened by existing topography and vegetation, and/or set back from roads and homes and thus would be minimally visible to sensitive receptors (e.g., motorists, trail users, residents). Moreover, as with the existing restroom facilities along the Fifield-Cahill ridge trail, the proposed restroom structures would be comprised primarily of wood and concrete, with non-reflective, earth-tone surfaces and finishes, and one to two small, rectangular, low-glare windows or non-reflective screened openings. Thus, there would be no impact related to creating a permanent source of substantial light or glare.

4.2.3.2 Approach to Analysis

Project Impacts

The visual analysis evaluates potential impacts on aesthetic resources that could occur during project construction and operations or as a result of facility siting. The analysis is based on: field observations of the project area and surrounding vicinity; review of preliminary engineering plans and drawings; review of adopted CEQA documents for other SFPUC projects in the Peninsula Watershed; evaluations of aerial and ground-level photographs of the project area; and review of relevant planning documents.

For the purpose of this section, the aesthetic resources analysis considers any area in the project vicinity from which existing public views could be affected by implementation of the project. The analysis focuses on potential effects on scenic vistas, scenic resources, and visual character, as described in Section 4.2.1, Environmental Setting.

The approach to evaluating project effects under each applicable significance criterion is briefly described as follows:

- ***Have a substantial adverse effect on a scenic vista.*** Impacts on scenic vistas are considered substantial when they involve landscape alterations or vertical encroachments that materially alter or obstruct landscape elements important to a scenic vista.
- ***Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings that contribute to a scenic public setting.*** Damage to a scenic resource is substantial to public views when it is reasonably perceptible to affected viewers and when it appreciably degrades one or more of the aesthetic qualities that contributes to a scenic public setting.
- ***Substantially degrade the existing visual character or quality of the site and its surroundings.*** A project is considered to substantially degrade the visual character or quality of a site if it would have a strongly negative influence on the public's experience and appreciation of the visual environment. Visual changes are considered in the context of public views of the site and locale's visual sensitivity; or how noticeable the changes might be to public views, based on the distance from a viewer, the nature of the changes, and the duration that a particular view would be available to the viewer.

Construction activities are typically considered temporary and thus have a less-than-significant impact on visual quality. However, construction activities occurring over a prolonged period could

result in significant visual impacts, particularly if scenic vistas would be substantially affected. Impacts from construction and operations activities that would cause changes to areas of the watershed from which no public views exist are considered less than significant.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach used in this EIR to conduct the cumulative analysis; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. The cumulative analysis for aesthetic resources impacts uses a list-based approach to analyzing the effects of the project in combination with past, present, and probable future projects in the immediate vicinity. The cumulative analysis considers whether the effects of project implementation in combination with other projects in the cumulative scenario would cause a significant, adverse cumulative impact, 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 impacts are deemed significant, then mitigation measures must be identified to reduce the project's contribution to the extent feasible.

4.2.3.3 Impact Summary

Table 4.2-1 summarizes the impacts of the project related to aesthetics. The impact summary table provides separate significance determinations for the proposed access program, access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access).

TABLE 4.2-1
SUMMARY OF IMPACTS – AESTHETICS

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact AE-1: Project construction would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	LS	LS	LS	LS
Impact AE-2: Project operation would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings.	LS	LS	LS	LS
Impact C-AE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on aesthetic resources.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required

4.2.3.4 Impact Analysis

Construction Impacts

Impact AE-1: Project construction would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings. (Less than Significant)

Implementation of the project could cause temporary construction-related impacts on scenic vistas, scenic resources, and the existing visual character of the project area and vicinity. Before construction at a given site or trail segment, the contractor would clear and grade the staging and construction work areas.[10] Construction activities would generally begin with preparation of the access drives, staging areas, and parking lots (which would also be used for construction staging). Once these areas have been established, the contractor would mobilize light- and heavy-duty construction equipment[11] and proceed with the earthwork and structural work for the trail routes. Construction of the restrooms, trail signage, fencing, and gates would follow. Trail and parking area surfacing would be among the last construction activities. Construction of the Fifield-Cahill ridge trail improvements (i.e., loop trail, parking lots, restroom, trailhead, and fencing) and the southern skyline ridge trail would occur in tandem, with work along the respective trail alignments generally proceeding in a linear fashion (e.g., from north to south for the southern skyline ridge trail). These activities would occur during the 12-month construction period. Given the linear nature of the project, trail work would be expected to proceed at approximately 150 to 250 feet per day.

The management plan EIR considers the potential for construction of new project facilities to affect the aesthetic resources of the watershed. For any new facilities that would cause potentially significant aesthetic changes, the management plan EIR recommends Program-Level Mitigation Measure I.1, which generally addresses project siting, disturbance, and revegetation.[12] Since certification of the management plan EIR, the SFPUC has developed a more detailed proposal for the project, and, as such, this EIR definitively determines whether project construction could result in substantial aesthetic changes. As described below, based on this new information and the associated impact analysis presented herein, project construction would not result in significant effects on scenic vistas, scenic resources, or visual character, and therefore no mitigation is required.

In addition to the increased presence of construction personnel and equipment, project construction would have potential direct and indirect effects on project area vegetation—an important contributing element to the watershed's scenic vistas, scenic resources, and visual character. Project implementation would require ground disturbance and vegetation trimming over an area of approximately 26.1 acres under the proposed access program and variant 1, and 37.4 acres under variants 2 and 3. In addition, the project would require removal of approximately 170 trees (about

10 Fencing alignments would be mowed but not fully grubbed or graded.
11 For a list of equipment types, see Table 2-1, Summary of Construction Requirements for the Proposed Project, in Chapter 2, Project Description.
12 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-12 to III.I-13); Section V.I, Aesthetics (p. V-37).

125 trees along the southern skyline ridge trail alignment and up to 45 trees from the Fifield-Cahill and loop trail ridge trail alignment) ranging in size from 4 inches to 56 inches in *diameter at breast height*.[13,14] As discussed in Section 2.6.7, Construction Debris Removal and Site Restoration of Chapter 2, Project Description, upon the completion of construction, the SFPUC would return disturbed areas beyond the project footprint (i.e., approximately 18.5 acres under the proposed access program and variant 1, and 29.2 acres under variants 2 and 3) to their approximate preconstruction conditions (e.g., recontoured and revegetated).

These changes would affect a relatively small proportion of the watershed (i.e., less than 1 percent of the total watershed area). Due to their location, extent, nature, and duration, project construction activities would not result in material alterations or view obstructions of landscape elements important to scenic vistas. The project would involve site disturbance and alterations to vegetation communities important to the aesthetic quality and character of the project area. These impacts would not be noticeable to motorists traveling along S.R. 92 due to distance, intervening topography and vegetation, and the project's location with respect to motorists' visual orientation. However, motorists traveling along S.R. 35 as well as visitors to the Caltrans vista point would have intermittent views of equipment, personnel, and vegetation clearing associated with the construction of access drives, the parking lot, fencing, and the trail. Barbed-wire fence installation under access program variants 2 and 3, and Portola Gate improvements under the proposed access program and variants, would be visible from the southernmost extent of Sweeney Ridge trail; however, the effects would not be appreciable given the intervening vegetation and topography and the small footprint of the work relative to the expansive landscape views, and considering that the project area would be restricted or closed to the public during the construction period. As a result, public views of construction activity from project trails would be similarly limited during construction. After construction, trimmed vegetation would naturally regrow and disturbed areas beyond the permanent project footprint would be returned to their approximate pre-construction topography and revegetated with a native seed mix. The aesthetic effects on trail users associated with project construction would not be appreciable. Moreover, views of project construction from Sweeney Ridge would be partially obscured by the Portola Gate—an approximately 150-foot long, 8-foot-tall, barbed-wire-topped, chain-link and pipe structure that presently delineates the project areas' northern boundary. For these reasons, project construction would not result in a substantial adverse effect on scenic vistas, would not substantially damage scenic resources that contribute to a scenic setting, and would not substantially degrade the existing visual character of the site or its surroundings. The overall impact related to scenic vistas, scenic resources, and visual character would be less than significant for the proposed access program and variants. Section 4.8, Biological Resources (Impact BI-7) and Section 4.11, Hazards and Hazardous Materials (Impact HZ-5) provide additional discussion of potential project effects related to the spread of plant pathogens and

13 Diameter at breast height is the tree diameter measured at 4.5 feet above the ground surface.

14 This number includes approximately 30 trees that would be removed in association with Fifield-Cahill ridge trail fencing under variants 2 and 3 (approximately two trees per fence mile), but which would not be removed under the proposed access program or variant 1. Please see Section 2.7.1, Trail Access Management Program and Visitation, for additional discussion of access programs.

increased wildfire risk during project construction, which could have secondary effects related to aesthetic resources.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would not result in substantial adverse effects on scenic vistas or scenic resources and would not degrade the existing visual character of the site or surroundings; therefore, impacts would be less than significant. No mitigation is required.

Operational Impacts

Impact AE-2: Project operation would not result in a substantial adverse effect on scenic vistas; would not substantially damage scenic resources that contribute to a scenic public setting; and would not substantially degrade the existing visual character of the site or its surroundings. (Less than Significant)

The management plan EIR considers the potential for trail amenities and increased public access to affect aesthetic resources of the watershed, but indicates that increased use would not necessarily result in adverse impacts. Regarding expanded trails and trail amenities with docent-led access, the management plan EIR concludes the aesthetic resources effects would be minimal.[15,16] As for expanded trails with unsupervised access, the management plan EIR notes adverse impacts could result if visitors were to trespass or otherwise improperly use the watershed, including by littering, disturbing vegetation, and damaging watershed facilities. To reduce the potential for impacts from unsupervised access, the management plan EIR recommends Program-Level Mitigation Measure I.3, which calls for improved security and enforcement of watershed rules; increased inspection and maintenance of publicly accessible facilities and use areas; and expanded public education regarding watershed resources and rules.[17] Since certification of the management plan EIR, the SFPUC has developed a more detailed proposal for the project, as presented in Chapter 2, Project Description. The following analysis considers these new details and concludes that the project would have minimal aesthetic resources impacts, and no mitigation is required.

Addition of New Facilities

Under the project, the SFPUC would install vertical project components (e.g., restrooms, trailhead kiosks, trail signage, fencing, gates, a bridge, and restroom facilities) in addition to at-grade project components (e.g., access drives, parking lots, and trail surfaces). This increase in

15 The management plan EIR considered docent-led access for the Fifield-Cahill ridge trail (Alternative D). The EIR assumed access for the southern skyline ridge trail would be unsupervised (Alternative A/B).

16 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-15 to III.I-17); Section V.I, Aesthetics (pp. V-37 to V-38).

17 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.I, Aesthetics (pp. III.I-15 to III.I-17); Section V.I, Aesthetics (pp. V-37 to V-38); Section VI.I, Aesthetics (p. VI-5).

development would change the project area's aesthetic character. As described in Section 4.2.1, Environmental Setting, these activities would occur in a naturalistic environment, where dramatic topography, mature and mostly intact vegetation communities, and broad scenic vistas are important components of the area's aesthetic character.

Installation of the project components would increase the development footprint within the watershed while reducing total vegetative cover. Implementation of the project would permanently disturb up to approximately 8 acres. Of this area, roughly 7 acres would be affected by at-grade developments (e.g., access drives, parking lots, and trail surfaces), while about 1 acre would be affected by vertical project components (e.g., fencing, gates, and restrooms).[18]

However, as represented in Figures 2-3a through 2-3e and Figure 2-4, as well as in the Figures 4.2-2a through 4.2-2c photographs, the majority of project components and activities are proposed for locations where similar types of development and operations already exist nearby. For example, north of S.R. 92, the construction contractor would install the proposed 50-car parking lot and restroom near Cemetery Gate in the vicinity of the managed grounds of Skylawn Memorial Park; construct the loop trail and loop trail parking lot near the existing Fifield-Cahill ridge trail, restroom facilities, and water tank; and improve and expand the chain-link fencing in areas where such fencing is already present (i.e., Cemetery Gate and Portola Gate). Barbed-wire fencing improvements (variants 2 and 3) would generally follow the existing road but would be offset by up to 50 feet on either side of the trail centerline so as to minimize visibility from the trail. Regarding new facilities south of S.R. 92, the SFPUC would locate the 20-car parking lot along S.R. 35 adjacent to the existing Caltrans vista point parking lot and nearby S.R. 92 and S.R. 35 intersection, and the southern skyline ridge trail alongside and set back from S.R. 35—a considerable stretch of which presently has guard rails, barbed-wire fencing, and overhead utility lines and runs parallel to a managed fuel break—and would construct the new access drives, gates, and chain-link fencing improvements along a segment of S.R. 35 where several turnouts, public roads, and private access drives, gates, and fencing are present. Restroom facilities and the prefabricated bridge proposed along the southern skyline ridge trail would be small relative to nearby residential developments and other structures and would also be set back from the road.

Project changes would generally occur proximate to existing development or management activities, would be similar in size and scale to those developments or activities, and would be subordinate to the aesthetic resources that contribute to the watershed's high scenic quality (i.e., topography, vegetation, and vistas). Project implementation would not result in material alterations or view obstructions of landscape elements important to scenic vistas. While some project changes would be intermittently visible to motorists traveling along S.R. 35 as well as to visitors to the Bay Area Ridge Trail (including Fifield-Cahill ridge trail and Sweeney Ridge Trail), the effects would be minimal due to the nature of the project proposal and intervening vegetation and topography. For these reasons, the installation of new facilities would not result in a substantial adverse effect on scenic vistas, would not substantially damage scenic resources that

[18] The installation of fencing along the Fifield-Cahill ridge trail would disturb approximately 26,000 square feet (0.6 acre) of watershed lands under variants 2 and 3 but not under the proposed access program or variant 1.

contribute to a scenic setting, and would not substantially degrade the existing visual character of the site or its surroundings. These effects would be less than significant.

Increased Public Access and Use

Plant pathogens, such as sudden oak death, have caused infestations of individual and clusters of trees within the watershed, which the SFPUC typically removes when detected.[19] Similarly, numerous fires have occurred in and adjacent to the watershed, most of which have ranged in size from 10 to 50 acres; however, a few recent fires have exceeded several hundred acres.[20,21] The SFPUC actively manages fire risks through mowing roadside vegetation, removing dead trees, and maintaining vegetated fuel breaks. The spread of sudden oak death and wildfires has caused localized adverse effects on watershed vegetation—an important visual resource and defining element of the watershed's aesthetic character and scenic vistas. The extent of those effects would be expected to continue and might expand with a warming climate.[22]

The management plan EIR analysis concludes that trespassing and improper use of public access areas could cause significant impacts as a result of litter, vegetation removal, vandalism, and fire. A recent survey of recreational land managers in the project vicinity confirmed that these types of activities also occur on other recreational lands in the region. Respondents noted that these activities—some of which are encountered daily—have not resulted in substantial adverse effects and can be managed through implementing such measures as fencing/physical barriers, regular maintenance, enforcement, and posting signage alerting visitors of watershed use regulations.[23]

Under the proposed access program (for Fifield-Cahill ridge trail) and variant 1, the cap on visitor use would increase; however, total visitation is not expected to substantially change because the number of visitors would be controlled, and trail users would still be required to register with the SFPUC and remain under docent supervision while in the watershed. Accordingly, it is not expected that watershed visitors under these restricted access programs would engage in activities that would result in adverse aesthetic resources impacts.

Under variant 2, with unrestricted and unsupervised access, visitor use is expected to increase substantially over current levels. The majority of trail users are expected to comply with use regulations and stay on designated trails. However, the recent land manager survey suggests that

19 Garbelotto, Matteo and Laura Sims, *Progress Report on Distribution of Phytophthora ramorum, Sudden Oak Death, Across the SFPUC Holdings in San Mateo County*, unpublished report prepared for SFPUC, January 2017, 18 pp.

20 San Francisco Water Department, *Peninsula Watershed Management Plan*, Appendix A-1, Peninsula Watershed Fire Management Element, Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018 (pp. 9 to 11).

21 Naras, Joe, Watershed Manager, and John Fournet, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, October 23, 2017.

22 U.S. Forest Service, Implications of Global Climate Change on the Distribution and Activity of *Phytophthora Ramorum, 2009, https://www.nrs.fs.fed.us/pubs/gtr/gtr-nrs-p-51papers/33venette-p-51.pdf,* accessed October 18, 2019. Fried, Jeremy; Torn, Margaret; and Mills, Evan, The Impact of Climate Change on Wildfire Severity: A Regional Forecast for Northern California, 2004, https://www.researchgate.net/publication/225973340_The_Impact_of_Climate_Change_on_Wildfire_Severity_A_Regional_Forecast_for_Northern_California, accessed October 18, 2019.

23 ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.

some level of noncompliance with watershed rules should be anticipated. Thus, it is reasonable to expect that with unsupervised access, a small number of visitors would disregard the SFPUC's trail-use rules (e.g., dog walking,[24] smoking, developing informal trails, and camping, among other prohibited activities). Limited infractions by a small percentage of users would not likely result in adverse aesthetics impacts, given the large size of the project area as well as intervening topography and vegetation that limit views from many publicly accessible vantage points. However, failure to observe the watershed access rules by a sufficient percentage of visitors could increase the risk of impacts on aesthetics resources. As described for variant 2 in Chapter 2, Project Description (Sections 2.7.1 and 2.7.2), the SFPUC would restrict off-trail access by installing barbed-wire fences; conducting regular inspections and repairs of watershed facilities, including fencing; posting signage with watershed rules; providing and regularly servicing restrooms and trash cans; and conducting security patrols. Therefore, while it is anticipated that the aesthetic resources of the watershed would be somewhat affected under variant 2, project design features, including the above-described operations and maintenance activities, would ensure substantial compliance with watershed rules (see Chapter 2, Project Description), and any effects would not be substantial.

Under the proposed access program (for the southern skyline ridge trail) and variant 3, visitation would be unsupervised but restricted to individuals or groups with a permit. As a result, project area visitation is expected to be less than for variant 2. The permit program would educate visitors about watershed rules and regulations prior to their visit. With increased visitor awareness, as well as the project design features described above (including barbed-wire fencing, frequent monitoring and maintenance, and security patrols, among others), the likelihood of visitors engaging in activities that would have substantial adverse impacts on aesthetic resources would be low. Any such impacts would be minimal, and limited to the immediate project area.

As discussed in Section 4.8, Biological Resources (Impact BI-7), and Section 4.11, Hazards and Hazardous Materials (Impact HZ-8), respectively, unsupervised access under the proposed access program (for the southern skyline ridge trail) and variants 2 and 3 could increase the potential for plant pathogens and wildfire to spread within the watershed. Given their cause and nature of spread, and considering existing and ongoing watershed fire management and pathogen prevention measures (described further in Sections 4.8 and 4.11), these effects would likely remain localized. Considering the scale of the vegetation that contributes to the watershed's aesthetic quality and character (i.e., landscape scale), such localized effects would not have a substantial adverse effect on scenic resources from vantage points beyond the project area (i.e., from vista points and public roadways). Such effects, if occurring near the trail, would be noticeable by trail users who could encounter clusters of charred or dying vegetation. However, as trail users would be in motion, traveling along the trail, such encounters would likely be brief and not substantially degrade the scenic character of the watershed from the visitor's vantage point.

[24] Service animals accompanying people with disabilities would be allowed in the watershed.

For the reasons described above, the effect on scenic vistas, scenic resources, and visual character would be less than significant for the proposed access program and variants.

Facilities Maintenance and Operations

With the addition of new facilities and the associated increases in visitation, watershed management and maintenance activities would also increase. Expanded visitation and maintenance activities would increase the frequency and number of vehicles and maintenance equipment within the project area, especially in the vicinity of parking lots and access drives. However, as described in Section 4.2.1, Environmental Setting, the SFPUC would perform project operations, such as maintaining trails, fencing, and restrooms, as part of its much larger and more intensive existing watershed management program, which includes maintaining roads and facilities as well as managing vegetation to reduce fire risk. Thus, project-related operations, including expanded visitation and maintenance activities, would be similar to ongoing operations within the watershed. As a result, the effects on scenic vistas, scenic resources, and visual character would be less than significant for the proposed access program and variants.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would not result in substantial adverse effects on scenic vistas or scenic resources and would not degrade the existing visual character of the site or surroundings; therefore, impacts would be less than significant. No mitigation is required.

Cumulative Impacts

Impact C-AE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on aesthetic resources. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis used throughout this EIR and summarizes the cumulative projects in the vicinity of the project. The geographic scope of potential cumulative impacts on aesthetic resources encompasses the locations from which a viewer could see the project's construction or operations elements, along with views of other projects in the cumulative scenario. A cumulatively significant effect on aesthetic resources would result if the effects of the project combined with those of cumulative projects would cause substantial degradation of the same scenic resources. As the project would have no light or glare impacts, it would not contribute to cumulative light or glare impacts.

With the exception of the Pacific Gas and Electric Company (PG&E) Gas Transmission Line project, the sites of all of the cumulative projects listed in Table 4.1-1 are within or along existing roadways, and these projects would not contribute to cumulative impacts related to the aesthetic resources discussed in Impacts AE-1 or AE-2, above. The PG&E Gas Transmission Line project

replaced a pipeline along west-facing slopes of the Peninsula Watershed, approximately 2 miles east of the project area. The PG&E pipeline replacement project involved construction-period impacts similar to those of the project (e.g., presence of heavy equipment, vegetation trimming and removal, exposed bare earth); however, major project construction activities were completed in December 2018. PG&E is now returning the project footprint to its approximate preconstruction condition, after which no substantial permanent aesthetic impacts will remain.

At a distance of approximately 2 miles, and considering the intervening topography and vegetation, the PG&E project is not visible from S.R. 35 or S.R. 92. Portions of the PG&E project area could be visible from portions of the Fifield-Cahill ridge trail and southern skyline ridge trail. However, given the distance between the two project areas, and considering that the PG&E project would have been completed for more than a year by the time the project is completed and open to the public, the impact on aesthetic resources would not be considerable and might not even be noticeable. Therefore, cumulative impacts related to aesthetic resources would not be significant.

Mitigation: None required.

4.3 Cultural Resources

This section describes the existing setting for cultural resources in the project area and evaluates the potential impacts on these resources associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project with the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). *Cultural resources* include architectural resources, prehistoric and historical archeological resources, and human remains.

Section 4.9, Geology, Soils, and Paleontological Resources, discusses paleontological resources and the potential for the project to affect those resources.

Of the comments received during the public scoping period, comments on cultural resources generally concern requests or recommendations to conduct the following: a cultural resources technical study; an archeological field survey; consultation with relevant Native American tribes, groups, and individuals; and consultation with the National Trust for Historic Preservation. Sections 4.3.1, Environmental Setting, and 4.3.3, Impacts and Mitigation Measures, and Section 4.12, Tribal Cultural Resources, address these comments.

4.3.1 Environmental Setting

The setting described herein lies entirely within the geographic scope of the cultural resources setting characterized in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR). This section expands on the cultural background discussion presented in that document.

4.3.1.1 Definitions

CEQA Area of Potential Effects

The definition of the *CEQA Area of Potential Effects* (C-APE) is modeled after the federal Area of Potential Effects, as defined in the Code of Federal Regulations title 36, section 800.16(d). The C-APE is the geographic area or areas within which a project may directly or indirectly cause alterations in the character or use of any historical resources (i.e., resources that meet the criteria for listing in the California Register of Historical Resources). The C-APE is influenced by the scale and nature of an undertaking and may be delineated differently for direct physical effects and for indirect effects (such as changes in the historical setting or introduction of intrusive noise) that could result from the undertaking. For the project, the EIR preparers defined a single C-APE to account for impacts on historical and archeological.

The C-APE is inclusive of all project components and proposed construction areas and staging areas. The C-APE encompasses the depths of excavation (i.e., vertical C-APE) as well as the areal extent of all proposed ground-disturbing activities (i.e., horizontal C-APE). The SFPUC would

construct the proposed southern skyline ridge trail and associated 20-vehicle parking lot, access drives, staging areas, restrooms, and fencing along an approximately 6-mile-long corridor, generally following State Route 35 (S.R. 35) from State Route 92 (S.R. 92) to the watershed's southern boundary with the Golden Gate National Recreation Area Phleger Estate. North of S.R. 92, the SFPUC would construct the proposed 0.5-mile-long universal access loop trail, four- and 50-vehicle parking lots, a restroom, and fencing (barbed-wire fencing under access program variants 2 and 3 only) along the Fifield-Cahill ridge trail between Cemetery Gate in the south and Portola Gate to the north.

To accommodate the proposed near-trail project components (e.g., fencing, access drives, restrooms, staging areas), the C-APE includes a 50-foot-wide buffer on both sides of the existing Fifield-Cahill ridge trail and proposed southern skyline ridge trail centerline, for an approximately 100-foot-wide construction corridor. In addition to this 100-foot-wide construction corridor, the C-APE includes the proposed barbed-wire fence alignment and proposed locations for vault toilets, access drives, and construction laydown/staging areas that might be sited beyond the 50-foot buffer. Finally, the C-APE includes the 27,450-square-foot, 20-vehicle parking lot proposed for the north end of the southern skyline ridge trail, and the 40,000-square-foot, 50-vehicle parking lot and restroom area proposed along Cahill Ridge Road, south of Cemetery Gate.

As stated above, the vertical C-APE extends from the ground surface to the maximum depth of proposed excavation. The majority of the project would involve ground disturbance of less than 2 to 3 feet below ground surface. Based on the proposed construction plans, the maximum depth of disturbance would be associated with the installation of soldier piles to support the five retaining walls and piers to support a pre-fabricated bridge along the southern skyline ridge trail. Although the depth of drilling for these soldier piles and piers would vary depending on the slope and underlying geology, the deepest drilling would be 30 feet for the bridge piers. Construction of the restrooms would require excavation to a depth of 6 feet.

4.3.1.2 Cultural Setting

The EIR preparers have adapted portions of this section from the Southern Skyline Boulevard Ridge Trail Extension Project Archeological Survey Report.[1] This report is on file at the SFPUC.

The project archaeological survey report One identifies a historic-period refuse deposit in the C-APE, but assesses it as not likely eligible for listing in the California Register of Historical Resources (California Register) or the National Register of Historic Places (National Register), as discussed below. As such, the refuse deposit does not appear to qualify as a historical resource under the eligibility criteria of the California Register or a historic property under the National Register. The C-APE also includes a portion of the Filoli Estate; however, all of the contributing

[1] AECOM, *Southern Skyline Boulevard Ridge Trail Extension Project Draft Archeological Survey Report*, prepared for SFPUC and Caltrans District 4, August 2017. This document (and all other documents cited in this report, unless otherwise noted) is available for review at the San Francisco Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

elements of the Filoli Estate are approximately 1.5 to 2 miles outside of the C-APE boundary. Section 4.3.1.3, *Research Methods and Results*, below, describes these resources.

Prehistoric Background

Archeologists have categorized the prehistoric period into cultural stages, thereby allowing researchers to describe a broad range of archeological resources with similar cultural patterns and components during a given timeframe and to create a regional chronology. Milliken et al.[2] provide a framework for the interpretation of the San Francisco Bay Area and have divided the human history of the region into five broad periods: the *Paleoindian Period* (13,500 to 10,000 years before present [BP]), the *Early Holocene Period* (10,000 to 5,500 BP), the *Early Period* (5,500 to 2,500 BP), the *Middle Period* (2,500 to 950 BP), and the *Late Period* (950 to 450 BP). Economic patterns, stylistic aspects, and regional phases further subdivide cultural patterns into shorter phases. This scheme uses economic and technological types, socio-politics, trade networks, population density, and variations of artifact types to differentiate between cultural periods.

Ethnographic Background

The C-APE is situated in an area that was formerly the territory of the *Ramaytush* Ohlone speaking people, a sub-branch of the Yok-Utian language stock. *Ramaytush* is one of eight Ohlone Indian languages spoken in California. The basic Ohlone social unit was the family household, which was extended patrilineally. A household was made up of about 15 individuals. Households grouped together to form villages, which in turn combined to form tribelets. There were approximately 40 Ohlone tribelets. Tribelets exchanged trade goods such as obsidian, shell beads, and baskets; participated together in ceremonial and religious activities; intermarried; and could have extensive reciprocal obligations to one another involving resource collection. The nearest neighbors to the *Ramaytush* were the *Ssalson* Ohlone tribelet.[3]

By the late 18th century, Spanish settlers moved into northern California, established the mission system, and dramatically transformed Ohlone culture. Many Ohlone were baptized by the Franciscan missionaries and made to work on mission farms. Following the secularization of the missions in 1834, many of the surviving Ohlone worked as manual laborers on ranchos.

Ohlone people currently live in their traditional territory, which includes San Mateo County, and continue to engage in traditional cultural practices. Tribal organizations in the county, like the Muwekma Ohlone Tribe of the Bay Area, provide members and the surrounding communities with economic, cultural, and educational opportunities.

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2 Milliken, Randall, Richard Fitzgerald, Mark G. Hylkema, Randy Groza, Tom Origer, David G. Bieling, Alan Leventhal, Randy S. Wiberg, Andrew Gottsfield, Donna Gillette, Viviana Bellifemine, Eric Strother, Robert Cartier, and David A. Fredrickson, "Punctuated Culture Change in the San Francisco Bay Area," Chapter 8 in *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, Altamira Press, Lanham, Maryland, 2007.

3 Milliken, Randall, Laurence H. Shoup, and Beverley R. Ortiz, *Ohlone/Costanoan Indians of the San Francisco Peninsula and their Neighbors, Yesterday and Today*, prepared for the National Park Service, Golden Gate National Recreation Area, June 2009.

Historical Background

The C-APE is located within an unincorporated area of San Mateo County, approximately 2 miles northwest of the incorporated town of Woodside. San Mateo County was organized in 1856 from what was then the southern portion of San Francisco County, and named after Saint Matthew—the evangelist and apostle who was popular among settlers in Spanish colonial times.

Settlers extensively used lands in the vicinity of the C-APE for logging and lumber production. The Gold Rush precipitated a construction boom in San Francisco, driving the need for lumber. Union Creek, to the northeast of the C-APE, once powered more than a dozen lumber mills. Mill operations were seasonal during the wet winter months. Evidence of old-growth logging (e.g., high-cut tree stumps) and traces of mills along Union Creek still remain.

An approximate 0.71-mile segment of the proposed southern skyline ridge trail traverses the southwestern historical boundary of the Filoli Estate, the former property of prominent San Franciscans, Mr. and Mrs. William Bowers Bourn. Mr. Bourn created the name Filoli by combing the first two letters from the key words of his credo: "Fight for a just cause; love your fellow man; live a good life." Architect Willis Polk was the principal designer of the Filoli house, a two-story Georgian Revival brick house. Construction of the Filoli Estate began in 1915, and the Bourns moved into the house in 1917. In 1936, a year after the death of the Bourns, Mr. and Mrs. William P. Roth purchased the estate. In 1975, Mrs. Roth donated 125 acres, which included the house and the formal garden, to the National Trust for Historic Preservation. The remaining acreage was given to Filoli Center, a nonprofit corporation established in 1976 to manage and promote the enhancement of the estate. The volunteer organization, Friends of Filoli, was created in 1978 to assist in leading tours of the property and raising funds. Today, the Filoli Center operates the entire 654-acre Filoli Estate.

4.3.1.3 Research Methods and Results

Background Research

Staff at the Northwest Information Center of the California Historical Resources Information System, located at Sonoma State University, conducted an archeological and historic resources records search on May 27, 2016 (File No. 15-1605). Environmental Science Associates staff updated the records search on December 21, 2016 and April 18, 2017 (File No. 16-1637). The Northwest Information Center, an affiliate of the State of California Office of Historic Preservation, is the official state repository of cultural resource records and studies for San Mateo County. On behalf of the San Francisco Planning Department, Environmental Science Associates reviewed previous studies that included the C-APE, along with records of archeological sites within the C-APE and a 0.25-mile radius, on the U.S. Geological Survey's Woodside, California 7.5-minute quadrangle. The following references were also reviewed:

- National Register of Historic Places
- California Register of Historical Resources
- Historic Property Data File for San Mateo, San Mateo County

- Five Views: An Ethnic Historic Site Survey for California
- California State Historical Landmarks
- California Inventory of Historic Resources
- California Points of Historical Interest
- California Place Names
- Historic Spots in California

Thirteen cultural resources studies have been completed within the records search radius, six of which included some portion of the C-APE. The records search indicated that 15 cultural resources have been previously identified within a 0.25-mile radius of the C-APE. There are no previously recorded archeological resources within the C-APE. One prehistoric archeological site consisting of a single bedrock mortar and two chert flakes is located approximately 420 feet west of the middle portion of the C-APE. The Bourn-Roth Estate (Filoli Estate) is in the southern portion of the C-APE. The Filoli Estate is listed in the National Register as a historic district (No. 75000479) and includes a house, landscaping, gardens, tea pavilion, a corporation yard, and additional auxiliary buildings. The other previously recorded resources all date to the historic period and include artificial depressions or borrow pits, unimproved road segments, concentrations of historic structural remains and debris, culverts, and the Skyline Quarry.

Survey Methods and Results

AECOM archeologists conducted a cultural resources pedestrian survey of the proposed southern skyline ridge trail alignment on July 1, 2016; November 4 to 7, 2016; and July 12 to 13, 2017.[4] On December 27, 2016, an Environmental Science Associates archeologist conducted a cultural resources pedestrian survey of all portions of the 50-vehicle parking lot and universal access loop trail C-APE.[5] On April 27 and 28, 2017, Environmental Science Associates archeologists conducted an intensive cultural resources pedestrian survey of the Fifield-Cahill ridge trail alignment.[6]

The pedestrian survey consisted of walking parallel transects spaced at no more than 30 feet apart, during which archeologists inspected the surface for cultural material or evidence thereof. When ground visibility was poor, the archeologists checked cleared areas and areas disturbed by rodents along and between transect lines with special attention. These prior ground disturbances consisted of graded turnouts, roadcuts into hillsides, and public restrooms/picnic locations. Heavy vegetation, including vines, trees, and large-growth bushes, covered much of the survey area. Ground visibility ranged from approximately 5 percent in areas of heavy ground vegetation to approximately 90 percent in areas with pine trees. Soils consisted of a medium brown silty clay

4 Milliken, Randall, Laurence H. Shoup, and Beverley R. Ortiz, *Ohlone/Costanoan Indians of the San Francisco Peninsula and their Neighbors, Yesterday and Today*, prepared for the National Park Service, Golden Gate National Recreation Area, June 2009.

5 Hoffman, Robin, and Heidi Koenig, *SFPUC Southern Skyline Boulevard Ridge Trail Extension Project: Skylawn Cemetery Access and Trailhead Improvements and Fifield-Cahill Ridge Trail Improvements, Cultural Resources Survey and Inventory*, Memorandum, September 5, 2017.

6 Ibid.

loam with moderate subangular inclusions. Archeologists did not survey some segments (approximately 20 to 25 percent) due to the steep slopes adjacent to the trail alignments.

Archeologists identified one historic-period archeological resource (SSBRTE-1) during the pedestrian surveys of the C-APE, in the southern portion of the southern skyline ridge trail centerline. SSBRTE-1 is a small, discrete, low-density, and apparently surficial historic-period refuse deposit that includes bottle glass fragments and base fragments, ceramic fragments, and a can lid. The resource likely dates to the early 1900s. Based on an assessment by AECOM archeologists, the resource does not appear to meet the eligibility criteria for the National Register or California Register.[7] No buildings or structures appear to be associated with this artifact concentration. While historic maps, including the 1894 Official Map of San Mateo County[8] and the 1948 U.S. Army topographic map,[9] show buildings across S.R. 35 from SSBRTE-1, no definitive association can be made between these buildings and the artifact deposit. Given the inability of archeologists to associate the artifact deposit with buildings and/or a person (or persons), it does not appear that SSBRTE-1 is associated with significant events or broad patterns of our history; thus, SSBRTE-1 is not likely eligible under National Register criterion A (see Section 4.3.2.1, *Federal Regulations*, below, for a description of criteria A through D). Similarly, as the artifact concentration is not directly associated with a person who gained prominence in his or her profession or made significant contributions in local, state, or national history, SSBRTE-1 is not likely eligible under criterion B. As a low-density artifact concentration of fairly common artifact types (e.g., earthenware, aqua- and sun-colored amethyst glass sherds), this resource does not embody the distinctive characteristics of a type, period, or method of construction. SSBRTE-1 does not represent the work of a master or possess high artistic value and therefore is not likely eligible under criterion C. SSBRTE-1 is a surficial artifact deposit and does not appear to have a subsurface component. As a low-density artifact concentration with a limited number of artifacts—likely representing a single depositional episode—SBRTE-1 is not associated with a specific time period or a specific cultural group and thus lacks historical context and information potential. Therefore, SSBRTE-1 does not appear eligible for listing in the National Register under Criterion D, nor does it appear eligible for listing in the California Register.

Archeologists did not identify any prehistoric archeological resources in the C-APE during the survey effort. The C-APE has a low sensitivity to contain prehistoric archeological resources, and the project has a low potential to uncover prehistoric archeological resources because: (1) much of the alignment is located on steep terrain that prehistoric inhabitants would not have likely occupied or settled; (2) the potential is low for human burial sites to be present beneath sediments along most of the alignment because of the relatively steep depositional setting; (3) no prehistoric archeological resources were identified despite intensive survey of 75 percent of the C-APE, which covered all areas that were accessible/level; and (4) project construction and future operations would involve relatively small areas of ground disturbance.

7 AECOM, *Southern Skyline Boulevard Ridge Trail Extension Project Draft Archeological Survey Report*, prepared for San Francisco Public Utilities Commission and Caltrans District 4, August 2017.
8 Official 1894 Map of San Mateo County California. Complied and drawn by Davenport Bromfield, County Surveyor, 1894.
9 U.S. Army topographic map (1:50,000 scale), 1948.

Archeologists did not identify architectural resources in the C-APE during the pedestrian surveys. Although the C-APE includes a portion of the Filoli Estate, its closest contributing elements are approximately 1.5 to 2 miles from the C-APE boundary.

4.3.1.4 Historical Society Correspondence

On January 4, 2017, AECOM sent letters to the San Mateo County History Museum and to the Filoli Center describing the project, including a map, and requesting any information or concerns they might have regarding cultural resources that could be affected by the project. No responses were received. AECOM made follow up phone calls to the San Mateo County History Museum and Filoli in June 2017, summarized below.

- ***San Mateo County History Museum*:** AECOM spoke with President Mitch Postel who stated that the San Mateo County History Museum had no concerns about this project.
- ***Filoli*:** AECOM left a voicemail message on June 26, 2017. AECOM spoke with the Director of Operations, Alex Fernandez, on June 29, 2017. Mr. Fernandez stated that he did not have any concerns regarding the project.

4.3.2 Regulatory Framework

4.3.2.1 Federal Regulations

Historical and archeological resources are considered through the National Historic Preservation Act of 1966, as amended (54 United States Code 306108), and its implementing regulations. Before an "undertaking" (e.g., federal funding or issuance of a federal permit) is implemented, section 106 of the preservation act requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register. Under the preservation act, a property is considered significant if it meets the National Register listing criteria A through D, at 36 Code of Federal Regulations 60.4, as follows:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> A. Are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> B. Are associated with the lives of persons significant in our past, or
>
> C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
>
> D. Have yielded, or may be likely to yield, information important in prehistory or history

For a resource to be eligible for the National Register, it must also retain enough integrity to be recognizable as a historic property and to convey its significance. Resources that are less than 50 years old are generally not considered eligible for the National Register.

Federal review of the effects of undertakings on significant cultural resources is carried out under section 106 of the National Historic Preservation Act and is often referred to as "section 106 review." This process is the responsibility of the federal lead agency. The section 106 review typically involves a four-step procedure, which is described in detail in the implementing regulations of the preservation act (36 Code of Federal Regulations 800):

- Define the Area of Potential Effects in which an undertaking could directly or indirectly affect historic properties
- Identify historic properties in consultation with the State Historic Preservation Office and interested parties
- Assess the significance of effects of the undertaking on historic properties
- Consult with the State Historic Preservation Officer, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties, notify the Advisory Council on Historic Preservation, and proceed with the project according to the conditions of the agreement

4.3.2.2 State Regulations

The State of California implements the National Historic Preservation Act of 1966, as amended, through its statewide comprehensive cultural resource surveys and preservation programs. The California Office of Historic Preservation, as an office of the California Department of Parks and Recreation, implements the policies of the preservation act on a statewide level. The Office of Historic Preservation also maintains the California Historical Resources Inventory. The State Historic Preservation Officer is an appointed official who implements historic preservation programs within the state's jurisdiction.

California Register of Historical Resources

The California Register is "an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change" (Public Resources Code section 5024.1[a]). The statute automatically considers certain resources to be eligible for the California Register, including those formally determined eligible for or listed in the National Register (Public Resources Code 5024.1[d][1]). These resources are termed *historical resources*.

Based on section 15064.5(a) of the CEQA Guidelines, historical resources include, but are not limited to, any object, building, structure, site, area, place, record, or manuscript that is historically or archeologically significant or that is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California. Generally, a lead agency considers a resource to be historically significant if it meets

the criteria for listing in the California Register (Public Resources Code section 5024.1), or qualifies as a "unique historical resource" (Public Resources Code section 21083.2).

To be eligible for the California Register, a cultural resource must meet one or more of the following criteria:

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

For a resource to be eligible for the California Register, it must also retain enough integrity of location, design, setting, materials, workmanship, feeling, and association to be recognizable as a historical resource and to convey its significance. Resources that are less than 45 years old are generally not considered eligible for the California Register.

For impact assessments under CEQA, lead agencies need only consider historically significant cultural resources; that is, resources that meet CEQA criteria for eligibility to the California Register as historical resources or unique archeological resources, as detailed below. Impact assessments under CEQA need not evaluate impacts on resources that do not meet these criteria. Similarly, for impact analyses of projects with federal involvement, only resources that meet the National Register eligibility criteria receive further consideration.

Archeological Resources and the California Environmental Quality Act

CEQA considers archeological resources to be an intrinsic part of the physical environment and thus requires that lead agencies evaluate the potential of the project to adversely affect archeological resources (CEQA section 21083.2). For a project that may have an adverse effect on a significant archeological resource, CEQA requires preparation of an EIR (CEQA section 21083.2 and CEQA Guidelines section 15065). CEQA recognizes two categories of significant archeological resources: a "unique" archeological resource (CEQA section 21083.2) and an archeological resource that qualifies as a "historical resource" (CEQA section 21084.1 and CEQA Guidelines section 15064.5).

Significance of Archeological Resources

A lead agency may determine that an archeological resource is significant as both or either a unique archeological resource or a historical resource, but the CEQA process for identifying the resource as either one or the other is distinct (CEQA section 21083.2[g] and CEQA Guidelines section 15064.5[a][2]).

An archeological resource is a historical resource under CEQA if the resource is:

- Listed on or determined eligible for listing in the California Register (CEQA Guidelines section 15064.5) under the criteria shown above (which includes National Register-listed or -eligible archeological properties)
- Listed in a "local register of historical resources"
- Listed in a "historical resource survey" (CEQA Guidelines section 15064.5[a][2])

A lead agency most commonly determines that an archeological resource meets the California Register eligibility criteria based on its potential scientific value; that is, it "has yielded, or may be likely to yield, information important in prehistory or history" (CEQA Guidelines section 15064.5 [a][3]). An archeological resource may be eligible to the California Register under other evaluation criteria, such as Criterion 1, association with events that have made a significant contribution to the broad patterns of history; Criterion 2, association with the lives of historically important persons; or Criterion 3, association with the distinctive characteristics of a type, period, region, or method of construction. Appropriate treatment for archeological properties that are eligible under California Register criteria other than Criterion 4 may be different from that for a resource that is significant exclusively for its scientific value.

The fact that an archeological resource has not previously been listed in any of these historical inventories is not conclusive evidence that the archeological resource is not a historical resource. When the lead agency believes there may be grounds for a determination that an archeological resource is a historical resource, then the agency should evaluate the resource with respect to the criteria for California Register eligibility (CEQA Guidelines section 15064.5[a][4]).

A unique archeological resource is a category of archeological resources created by the CEQA statutes (CEQA Guidelines section 21083.2[g]). An archeological resource is a unique archeological resource if it meets any one of three criteria:

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

Under CEQA, lead agencies are required to first assess whether an archeological resource is a historical resource, and then assess whether the resource is a unique archeological resource. CEQA Guidelines state: "…when a project will impact an archeological site, a lead agency shall first determine whether the site is an historical resource" (CEQA Guidelines section 15064.5 [c][1]).

Evaluation of an Archeological Resource as Scientifically Significant

CEQA requires projects to address potential project effects on historical resources (as defined above). The published CEQA guidance of the California State Office of Historic Preservation for

CEQA provides the methodological standard for evaluating the scientific value, and thus the California Register eligibility under Criterion 4, of an archeological resource. As guidance for such evaluations, the Office of Historic Preservation has issued two guidelines: Archeological Resource Management Reports[10] and the Guidelines for Archeological Research Designs.[11] The eligibility of archeological resources for the California Register under criteria 1 and 2 (association with significant events or people) is generally based on the development of a historical context within which the relationship of the resource to significant events or people can be understood.[12]

Integrity of an Archeological Resource

Integrity is an essential criterion in determining whether a potential resource, including an archeological resource, is a historical resource. For CEQA purposes, the integrity of a historical resource can in part be expressed in the requirement that it must retain "the physical characteristics that convey its historical significance" (CEQA Guidelines section 15064.5 [b]).

For an archeological resource that is evaluated for California Register eligibility under Criterion 4 ("has yielded or may be likely to yield information important to prehistory or history"), the definition of integrity is conceptually different from the definition usually applied to the built environment. For a historic building, integrity means that the building retains the defining characteristics from the period of significance of the building. In archeology, an archeological deposit or feature may have undergone substantial physical change from the time of its deposition but may yet have sufficient integrity to qualify as a historical resource. The integrity test for an archeological resource is whether the resource can yield sufficient data (in type, quantity, or quality) to address significant research questions. Thus, in archeology, integrity is often closely associated with the development of a research design that identifies the types of physical characteristics that must be present in the archeological resource and its physical context to adequately address research questions appropriate to the resource.

California Public Resources Code Sections 5097.98 and 5097.99

Public Resources Code section 5097.98 (and reiterated in CEQA Guidelines section 15064.5[e]) identifies steps for lead agencies to follow in the event of the accidental discovery or recognition of human remains in any location other than a dedicated cemetery. Public Resources Code section 5097.99, as amended, states that no person shall obtain or possess any Native American artifacts or human remains that are taken from a grave or cairn. Any person who knowingly or willfully obtains or possesses any such artifacts or human remains is guilty of a felony, which is punishable by imprisonment. Any person who removes, without authority of law, any such items with an intent to sell or dissect or with malice or wantonness is also guilty of a felony.

10 California Office of Historic Preservation, *Archeological Resource Management Reports, Recommended Contents and Format,* February 1990.
11 California Office of Historic Preservation, *Guidelines for Archeological Research Designs,* February 1991.
12 California Office of Historic Preservation, *Instructions for Recording Historical Resources*, March 1995.

California Health and Safety Code Section 7050.5

Section 7050.5 of the California Health and Safety Code protects human remains by prohibiting the disinterment, disturbance, or removal of human remains from any location other than a dedicated cemetery.

California Native American Historic Resource Protection Act

The California Native American Historic Resources Protection Act of 2002 imposes civil penalties, including imprisonment and fines of up to $50,000 per violation, for individuals who unlawfully and maliciously excavate upon, remove, destroy, injure, or deface a Native American historic, cultural, or sacred site that is listed or may be listed in the California Register.

4.3.2.3 Local Regulations

There are no local regulations related to cultural resources that apply to this project.

4.3.3 Impacts and Mitigation Measures

4.3.3.1 Significance Criteria

The project would have a significant effect on cultural resources if it were to:

- Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines section 15064.5, including those resources listed in Article 10 or Article 11 of the San Francisco Planning Code;
- Cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5; or
- Disturb any human remains, including those interred outside of formal cemeteries.

4.3.3.2 Approach to Analysis

This cultural resources impact analysis considers both construction and operational impacts associated with the project. While most impacts on archeological resources and human remains tend to occur during the construction phase of a project, there is a potential for project operations to affect these types of resources. For example, project maintenance and increased public access could affect archeological resources through general increases in trail use and management activities that could impinge on the setting or cause deterioration over time. The project is unlikely to affect historic architectural resources, if any such resources are present in the C-APE.

Architectural Resources

For CEQA purposes, lead agencies are required to assess potential impacts on architectural resources by identifying any activities (either during construction or operations) that could affect architectural resources that have been identified as historical resources. No historic architectural resources have been identified in the C-APE, so no further analysis is required.

Archeological Resources

Archeological resources can include historical resources, according to section 15064.5, as well as unique archeological resources, as defined in section 21083.2(g). Lead agencies typically assess the significance of most prehistoric and historic archeological sites under National Register criterion D and California Register criterion 4 (which are substantially the same for both the National and California Registers). This criterion stresses the importance of the information potential contained within the site rather than the resource's significance as a surviving example of a type or its association with an important person or event. Although it is less common, the lead agency may also assess archeological resources under California Register criteria 1, 2, and/or 3. Archeological resources may also be assessed under CEQA as unique archeological resources, defined as archeological artifacts, objects, or sites that contain information needed to answer important scientific research questions.

Impacts on unique archeological resources or archeological resources that qualify as historical resources are assessed pursuant to section 21083.2, which states that the lead agency shall determine whether the project may have a significant effect on archeological resources. As with architectural resources, the lead agency must determine whether project impacts would "cause a substantial adverse change in the significance" of the resource (CEQA Guidelines section 15064.5[b]). A substantial adverse change could include disturbance of a resource, physical destruction of all or part of an archeological deposit, or the collection of materials that results in a loss of information.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including Public Resources Code sections 5097.98 and 5097.99, and Health and Safety Code section 7050.5. This EIR discusses these laws above in Section 4.3.2, Regulatory Framework. This EIR analysis considers impacts on human remains, including intentional disturbance, mutilation, or removal of interred human remains.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach used in this EIR to conduct the cumulative analysis; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. The cumulative analysis for cultural resources uses a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in the C-APE. Similar to the analysis for project impacts, the cumulative impact analysis assumes that other projects in the C-APE would be constructed and operated in compliance with design standards, applicable permits, and environmental review requirements, and, where warranted, would incorporate mitigation for any impacts on cultural resources to avoid and/or reduce impacts on a project-by-project basis.

The cumulative analysis considers whether the effects of project implementation, in combination with the effects of other proximate past, present, and probable future projects, would result in a significant, adverse cumulative impact on historical resources, and, if so, whether the project's contribution to the cumulative impact would be considerable. Both conditions—the effects of

project implementation and the project's contribution to the cumulative impact—must apply in order for a project's contribution to cumulative effects to be deemed cumulatively considerable (significant). If effects are deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.3.3.3 Impact Summary

Table 4.3-1 summarizes the impacts of the project related to cultural resources. The impact summary table provides separate significance determinations for the proposed access program, access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access).

TABLE 4.3-1
SUMMARY OF IMPACTS – CULTURAL RESOURCES

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact CU-1: Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	LSM	LSM	LSM	LSM
Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries.	LSM	LSM	LSM	LSM
Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	LSM	LSM	LSM	LSM
Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries.	LSM	LSM	LSM	LSM
Impact C-CU-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on historical resources, archeological resources, or human remains.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.3.3.4 Impact Analysis

The impact discussions presented below evaluate potential project impacts related to the above significance criteria. For significance criteria that are addressed in the Peninsula Watershed Management Plan EIR, the impact discussions tier from and summarize the impact analyses in

the management plan EIR. Therefore, this EIR incorporates by reference the relevant portions of the management plan EIR impact analyses.

As discussed in Chapter 2, Project Description, ground disturbance associated with project construction and operation would vary among the proposed access program and the access program variants under consideration. For example, under the proposed access program and variant 1, the SFPUC would not construct new barbed-wire fencing along the Fifield-Cahill ridge trail between Cemetery Gate and Portola Gate, but would install fencing along the trail under access program variants 2 and 3. Thus, variants 2 and 3 would involve ground disturbance along the fenceline while the proposed access program and variant 1 would not. Similarly, under the proposed access program and variant 1, project visitation would be supervised and would be capped at 24,960; under access program variants 2 and 3, the number of visitors could be as high as double. Despite this variation, the potential is low for sensitive cultural resources to be present within the C-APE, as described in Section 4.3.1.2, *Cultural Setting*; therefore, the potential effects on cultural resources would be substantially similar for the proposed access program and the variants, with some additional ground disturbance under variants 2 and 3 for the construction of fencing. Therefore, the impact evaluations below combine the discussions for the proposed access program and the variants.

Construction Impacts

Impact CU-1: Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5. (Less than Significant with Mitigation)

The management plan EIR analyzes the potential impacts on archeological resources of constructing a new trail and associated facilities within the project area. The management plan EIR concludes that project construction would increase the potential for disturbance of archeological resources and that such an impact would be significant, since any such resources could potentially be historical resources pursuant to CEQA Guidelines section 15064.5.[13] The management plan EIR explains that implementation of Program-Level Mitigation Measure H.2 would reduce potential effects on archeological resources to a less-than-significant level.[14] This measure outlines several actions to be taken prior to and during construction, such as preconstruction surveys, and work stoppage in the event of inadvertent discovery, among others, to reduce potential effects on archeological resources. This EIR presents a refined analysis to address additional site-specific and project-level details that the SFPUC has developed since management plan EIR certification, and Program-Level Mitigation Measure H.2 has been updated (below) to reflect the planning department's current approach to addressing such potential effects.

13 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.H, Cultural Resources (pp. III.H-8 to III.H-14); Section V.H, Cultural Resources (pp. V-34 to V-36), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

14 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section IV.H, Cultural Resources (pp. IV-3 to IV-4).

As noted in Section 4.3.1, Environmental Setting, AECOM and Environmental Science Associates completed records searches at the Northwest Information Center that revealed no previously documented archeological resources in the C-APE. Based on the review of geological maps and previous subsurface investigations, it does not appear likely that deeply buried archeological resources are present in the C-APE.

AECOM and Environmental Science Associates conducted intensive pedestrian surveys of the entire C-APE, and no prehistoric archeological resources were identified. One historic-period archeological resource, SSBRTE-1, was identified in the southern portion of the southern skyline ridge trail centerline. SSBRTE-1 is a small, discrete, low-density, and apparently surficial historic-period refuse deposit that includes bottle glass fragments and base fragments, ceramic fragments, and a can lid. The resource likely dates to the early 1900s. AECOM archeologists assessed the resource as not appearing to meet the eligibility criteria of the National Register or California Register. On the basis of this assessment, the resource does not appear to qualify as a historical resource or a unique archeological resource pursuant to CEQA Guidelines section 15064.5.[15]

Based on the results of the surface survey and the environmental context, described above in Section 4.3.1.3, *Research Methods and Results*, and because no historical resources were identified within the C-APE, the potential appears low that the project would uncover archeological resources during construction activities for the proposed access program and variants. However, the potential for the project to cause accidental discovery of archeological resources during ground-disturbing activities cannot be entirely discounted. Disturbance of an archeological resource could damage the resource and result in a significant impact, as defined by CEQA Guidelines section 15064.5. Thus, the potential for project-related construction activities to affect archeological resources is considered significant. Implementation during project construction of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits by requiring the SFPUC and its contractors to adhere to the appropriate procedures and protocols to identify and appropriately treat archeological resources discovered during construction activities. These procedures would reduce the potential impact to a less-than-significant level.

Mitigation Measure M-CU-1 applies to construction of all project components under the proposed access program and variants.

Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.

The following mitigation measure is required to avoid any potential adverse effect from the project on accidentally discovered buried archeological resources as defined in CEQA Guidelines section 15064.5(a) and (c). The SFPUC shall distribute the San Francisco Planning Department archeological resource "ALERT" sheet to the project prime contractor; to any project subcontractor (including demolition, excavation, grading, foundation, pile driving, etc. firms); or utilities firm involved in soils disturbing activities

[15] AECOM, *Southern Skyline Boulevard Ridge Trail Extension Project Draft Archeological Survey Report*, Prepared for San Francisco Public Utilities Commission and Caltrans District 4, August 2017.

within the project site. Prior to any soils disturbing activities being undertaken each contractor is responsible for ensuring that the ALERT sheet is circulated to all field personnel, including machine operators, field crew, pile drivers, supervisory personnel, etc. The SFPUC shall provide the Environmental Review Officer with a signed affidavit from the responsible parties (prime contractor, subcontractor(s), and utilities firm) to the review officer confirming that all field personnel have received copies of the ALERT sheet.

Should any indication of an archeological resource be encountered during any soils disturbing activity of the project or during project operation, the project head foreman and/or SFPUC shall immediately notify the review officer and shall immediately suspend any soils disturbing activities in the vicinity of the discovery until the review officer has determined what additional measures should be undertaken.

If the review officer determines that an archeological resource may be present within the project site, the SFPUC shall retain the services of an archeological consultant from the pool of qualified archeological consultants maintained by the planning department archeologist. The archeological consultant shall advise the review officer as to whether the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the review officer may require, if warranted, specific additional measures to be implemented by the project sponsor.

Measures might include preservation in situ of the archeological resource; an archeological monitoring program; or an archeological testing program. If an archeological monitoring program or archeological testing program is required, it shall be consistent with the Environmental Planning division guidelines for such programs. The review officer may also require that the SFPUC immediately implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions.

The project archeological consultant shall prepare a final archeological resources report that evaluates the historical significance of any discovered archeological resource and describes the archeological and historical research methods employed in the archeological monitoring/data recovery program(s) undertaken. Information that may put at risk any archeological resource shall be provided in a separate removable insert within the report.

The project archeological consultant shall send copies of the draft archeological resources report to the review officer for review and approval. Once approved by the review officer, the project archeological consultant shall distribute copies of the final archeological resources report as follows: (1) California Archeological Site Survey Northwest Information Center shall receive one copy, with a copy of the transmittal of the archeological resources report to the Northwest Information Center sent to the review officer; (2) the Environmental Planning division of the planning department shall receive one bound copy, one unbound copy and one unlocked, searchable PDF copy on CD along with copies of any formal site recordation forms (California Department of Parks and Recreation 523 series) and/or documentation of nomination to the National Register of Historic Places/California Register of Historical Resources. In instances of high public

interest or interpretive value, the review officer may require a different final report content, format, and distribution than that presented above.

The treatment of human remains and of associated or unassociated funerary objects discovered during any soils disturbing activity shall comply with applicable state and federal laws. This shall include immediate notification of the Coroner of the County of San Mateo and in the event of the coroner's determination that the human remains are Native American remains, notification of the California State Native American Heritage Commission who shall appoint a Most Likely Descendant (Public Resources Code section 5097.98). The archeological consultant, SFPUC, Environmental Review Officer, and Most Likely Descendant shall have up to but not beyond six days after the discovery to make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines section 15064.5[d]). The agreement should take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. Nothing in existing state regulations or in this mitigation measure compels the SFPUC and the review officer to accept recommendations of a Most Likely Descendant. The archeological consultant shall retain possession of any Native American human remains and associated or unassociated burial objects until completion of any scientific analyses of the human remains or objects as specified in the treatment agreement if such as agreement has been made or, otherwise, as determined by the archeological consultant and the review officer.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail could inadvertently damage archeological resources, thus causing an adverse change in the significance of the resource. Implementation of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would reduce this potential impact on archeological resources to a less-than-significant level. For the reasons presented in the impact discussion, construction of the project with the proposed access program would have a less-than-significant impact on archeological resources with implementation of the recommended mitigation.

Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation)

The management plan EIR analyzes the potential impacts on human remains of constructing a new trail and associated facilities within the project area. The management plan EIR concludes that project construction would increase the potential for disturbance to cultural resources (including human remains), which would be significant.[16] The management plan EIR explains that implementation of Program-Level Mitigation Measure H.2 would reduce potential project

[16] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.H, Cultural Resources (pp. III.H-8 to III.H-14); Section V.H, Cultural Resources (pp. V-34 to V-36).

effects related to disturbing human remains to a less-than-significant level.[17] This measure outlines several actions to be taken prior to and during construction to reduce these potential effects, such as preconstruction surveys, and work stoppage in the event of inadvertent discovery, among others. This EIR further refines the analysis, as presented below, to address additional site-specific and project-level details that the SFPUC has developed since management plan EIR certification, and the mitigation has been updated to reflect the planning department's current approach to addressing such potential effects.

Although no known human remains have been identified within the project C-APE, the possibility that human remains are present and could be subject to inadvertent disturbance during construction of the project (including the proposed access program and variants) cannot be entirely discounted. Although unlikely, earthmoving activities associated with project construction could result in direct impacts on previously undiscovered human remains, which would be a significant impact. However, implementation during project construction of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any buried human remains and associated or unassociated funerary objects that are discovered during project construction activities by requiring the SFPUC to solicit the Most Likely Descendant's recommendations and adhere to appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition protocols. Implementation of this measure would reduce the potential impact to a less-than-significant level.

> *Mitigation Measure M-CU-1 applies to construction of all project components under the proposed access program and variants.*
>
> **Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.**
>
> (See Impact CU-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail could result in a significant impact related to the inadvertent disturbance of human remains. However, implementation during construction of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would reduce the potential impact to a less-than-significant level. For the reasons presented in the impact discussion, construction of the project with the proposed access program would have a less-than-significant impact on previously undiscovered human remains with implementation of the recommended mitigation.

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[17] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section IV.H, Cultural Resources (pp. IV-3 to IV-4).

Operational Impacts

Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5. (Less than Significant with Mitigation)

The management plan EIR evaluates the potential effects on archeological resources from increased public access within the watershed. The analysis generally concludes that increased public access, if not limited to the trail, could increase the potential for damage to archeological resources due primarily to vandalism or inadvertent disruption.[18] The management plan EIR acknowledges the potential for such impacts would be lowest if access were to occur under docent supervision. The management plan EIR also acknowledges that there is potential for impacts on previously unknown archeological resources under the project. Despite the low potential for adverse effects described in the management plan EIR, the management plan EIR recommends implementation of Program-Level Mitigation Measure H.1, which calls for the SFPUC to regularly inspect and maintain the facilities and areas used by the public and to inspect watershed perimeter fencing—which would limit unsupervised public off-trail access—as one means of reducing potential impacts on archeological resources. The analysis concludes that with implementation of this mitigation the effects would be less than significant.[19,20]

Since certification of the management plan EIR, the SFPUC has developed a more detailed trail proposal. As discussed in Chapter 2, Project Description, Section 2.7.2, Trail and Facilities Operations and Maintenance, the SFPUC would implement as part of the project some of the measures recommended in Program-Level Mitigation Measure H.1, including increased security patrols and watershed fencing inspection. Based on the new construction and operation details included in the current proposal, and on the associated archeological resources impacts analysis presented herein, it is concluded that project operations under the proposed access program and variants would have a low potential for impacts on archeological resources, as assessed below.

As discussed in Impact CU-1, the only known archeological resource in the C-APE is historic-period refuse deposit SSBRTE-1. The archeological assessment (see Section 4.3.1.3, *Research Methods and Results*, above) determined this resource does not appear to qualify as a historical resource or a unique archeological resource pursuant to CEQA Guidelines section 15064.5. As no historical resources have been identified in the C-APE, project operations and maintenance as well as access activities associated with the proposed access program and variants are not anticipated to result in impacts on known archeological resources.

For the same reasons set forth in Impact CU-1 for archeological resources (i.e., low potential for presence, minimal ground disturbance, proposed security measures), there is a low potential for project-related operations, including public access, to adversely affect archeological resources.

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18 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.H, Cultural Resources (pp. III.H-8 to III.H-14); Section V.H, Cultural Resources (pp. V-34 to V-36).

19 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section V.H, Cultural Resources (pp. V-34 to V-36).

20 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section IV.H, Cultural Resources (p. IV-3 to p.IV-4).

Specifically, considering the project description includes elements that would restrict project visitors to developed trail areas (e.g., fencing and security patrols) and because trail use would not cause substantial ground disturbance, increased public use would not appreciably increase the potential for inadvertent discovery by the general public. However, despite the low potential for discovery, project operations involving ground disturbance (e.g., trail repair and maintenance, tree removal) could inadvertently unearth and damage an archeological resource. Thus, the potential for project-related operational activities to affect archeological resources is considered significant. Implementation during project operations of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits by requiring the SFPUC to adhere to the appropriate procedures and protocols to identify and appropriately treat archeological resources discovered during operational activities. These procedures would reduce the potential impact to a less-than-significant level.

Mitigation Measure M-CU-1 applies to operation of all project components under the proposed access program and variants.

Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains.

(See Impact CU-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail has a low potential to significantly affect archeological resources by inadvertently damaging and thus causing an adverse change in the significance of such resources. Implementation during project operations of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would reduce potential impacts on archeological resources to a less-than-significant level. For the reasons presented in the analysis, operation of the project with the proposed access program would have a less-than-significant impact on archeological resources with implementation of the recommended mitigation.

Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries. (Less than Significant with Mitigation)

Based on the background research and survey efforts completed by AECOM and Environmental Science Associates, as well as communication with Native American groups, no human remains are known to be present in the C-APE. For the same reasons presented in Impact CU-2 (i.e., low potential for presence, minimal ground disturbance, proposed security measures), the potential would be low for project-related operations activities, including public access under the proposed access program and variants, to adversely affect human remains. And for the same reasons described for inadvertent discovery of archaeological resources in Impact CU-3 (i.e., limited access beyond developed trail areas and minimal ground disturbance), increased visitation

would not substantially increase potential for encountering or disturbing human remains. However, as also noted for Impact CU-3, project operations and maintenance activities would likely involve ground disturbance which could inadvertently unearth and damage human remains. Thus, the potential for project-related operational activities to affect human remains is considered significant. Implementation during project operations of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any buried human remains and associated or unassociated funerary objects that are discovered during project operational activities by requiring the SFPUC to solicit the Most Likely Descendant's recommendations and adhere to appropriate excavation, removal, recordation, analysis, custodianship, curation, and final disposition protocols. These procedures would reduce the potential impact to a less-than-significant level.

Mitigation Measure M-CU-1 applies to operation of all project components under the proposed access program and variants.

Mitigation Measure M-CU-1 – Accidental Discovery of Archeological Resources and Human Remains

(See Impact CU-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail has a low potential to significantly affect archeological resources by inadvertently damaging and thus causing an adverse change in the significance of such resources. Implementation of Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would reduce potential impacts to a less-than-significant level. For the reasons presented in the impact analysis, operation of the project with the proposed access program would have a less-than-significant impact on previously undiscovered human remains with implementation of the recommended mitigation.

Cumulative Impacts

Impact C-CU-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on historical resources, archeological resources or human remains. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed throughout this EIR and summarizes the cumulative projects in the vicinity of the project; the cumulative impacts portion of Section 4.3.3.2, *Approach to Analysis*, provides additional details on the approach to cumulative analysis performed herein. The geographic scope for cumulative effects on historical resources, archeological resources, and human remains consists of the project C-APE. The cumulative analysis evaluates historical resources, archeological resources, and human remains as a single, nonrenewable resource base. It considers the additive effect of potential project impacts on: architectural resources or archeological resources that qualify

as historical resources, as defined in CEQA Guidelines section 15064.5; and human remains. The project would result in a cumulatively considerable (significant) impact if project impacts after mitigation, combined with the impacts of one or more cumulative projects, were to cause a substantial adverse effect on the same cultural resource.

Federal, state, and local laws protect archeological resources in most instances. Even so, it is not always feasible to entirely avoid archeological sites or retain them in situ. Because all significant cultural resources are unique and nonrenewable members of finite classes, any adverse effects or negative impacts erode a dwindling resource base.

The only known historical resource in the C-APE is the Filoli Estate, whose nearest contributing element is approximately 1.5 miles from the C-APE; therefore, the project would not result in impacts on that resource or any other historical resources. The only known archeological resource in the C-APE is a historic-period refuse deposit SSBRTE-1, which a qualified consultant (AECOM) determined did not appear to be eligible for listing in the National Register or California Register and therefore would not qualify as an archeological resource pursuant to CEQA Guidelines section 15064.5.[21] The project would not affect any known human remains. As a result, significant cumulative impacts on cultural resources would not occur.

Mitigation: None required.

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[21] AECOM, *Southern Skyline Boulevard Ridge Trail Extension Project Draft Archeological Survey Report*, prepared for San Francisco Public Utilities Commission and Caltrans District 4, August 2017.

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4.4 Transportation and Circulation

This section describes the existing transportation and circulation conditions in the project area and identifies the potential transportation and circulation resource impacts that could result from implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project under the proposed access program (docent program along the Fifield-Cahill ridge trail and unsupervised/restricted access along the southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). This section also identifies mitigation measures to avoid or reduce significant adverse impacts.

Of the comments received during the public scoping period, comments on the topic of transportation and circulation were generally about the effect of access management options on adjacent lands and trails, the expected number of trail users and visitors, construction activities affecting California Department of Transportation (Caltrans) right-of-way, Americans with Disabilities Act compliance, transportation demand management elements, transportation management plans, safety concerns related to trail users crossing State Routes 92 and 35 (S.R. 92 and S.R. 35, respectively), public transportation connections, effects of parking lot sizes, and potential increased use of the Purisima Creek Redwoods Open Space Preserve north parking lot by trail users. Except for the request to consider transportation demand management elements (presented below), Sections 4.4.1, Environmental Setting, and 4.4.3, Impacts and Mitigation Measures, address these comments.

The project design does not incorporate the transportation demand management elements highlighted by Caltrans as part of its scoping comments because the project would not result in any vehicle congestion that would require mitigation through transportation demand management-related vehicle trip reductions (see analysis below). Furthermore, as stated in Section 2.5.1.1, *Southern Skyline Boulevard Ridge Trail Extension*, the design of the proposed new 20-vehicle parking lot would be coordinated with Caltrans and adhere to the SFPUC Engineering Management Bureau's design guidelines. Therefore, the SPFUC would address specific considerations related to vehicle and bicycle parking and compliance with applicable codes and standards during the design phase and would not change the analysis or conclusions contained in this CEQA evaluation.

4.4.1 Environmental Setting

The project would be located within the Peninsula Watershed, which is described in detail in the SFPUC 2001 Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR).[1] Consequently, the relevant setting information presented in the management plan EIR is summarized and incorporated by reference, and not repeated herein. Additional new setting information is provided where it is relevant to and necessary for the

[1] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.J (p. III.J-1) and Section V (p. V-38), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

impact analysis, where it reflects new information or changed circumstances from that presented in the management plan EIR, or where it provides more specific detail to support a project-level analysis.

4.4.1.1 Roadway Network

The management plan EIR states that the Peninsula Watershed area is served by a roadway network that includes S.R. 92; S.R. 35, also known as Skyline Boulevard; Interstate 280 (I-280); and arterial, collector, and local roadways (see Figure 2-1 in Chapter 2, Project Description). The portion of the project proposed south of S.R. 92 would generally parallel S.R. 35 through the watershed. Roadway access to the area is generally limited to S.R. 35 and S.R. 92. The portion of the project proposed for north of S.R. 92 would be accessed from S.R. 92 via Skyline Quarry or Cahill Ridge Road through the Skylawn Memorial Park (see Figure 2-2). S.R. 92 connects the cities of San Mateo and Half Moon Bay and bisects the watershed between the Upper and Lower Crystal Springs reservoirs; it carries about 26,800 to 28,900 vehicles per day in this area.[2] S.R. 35 parallels I-280 along the eastern boundary of the watershed north of S.R. 92, joins S.R. 92 and crosses the watershed, and then extends south from S.R. 92 along the western boundary of the watershed. North and south of S.R. 92, S.R. 35 is identified as Skyline Boulevard. Along the 1-mile segment that it shares with S.R. 92, S.R. 35 is identified as Half Moon Bay Road. North of S.R. 92, S.R. 35 carries about 3,400 vehicles per day and about 2,500 vehicles per day south of S.R. 92.[3] The I-280 freeway carries about 96,000 to 127,000 vehicles per day in this area.[4]

The standard criterion used by Caltrans to define quality of traffic flow on state highways is level of service (LOS). This is a quantitative assessment of factors such as speed, volume, geometry, delays, and ease of maneuvering. All analysis techniques specify the quality of operations as a letter, with "A" representing the best operating condition and "F" representing the worst. Based on an analysis conducted by CHS Consulting in July 2017,[5] the LOS on S.R. 92 at the S.R. 92/S.R. 35 intersection is LOS E during the middle of the day on weekends when traffic volumes are highest. During this same time period, S.R. 35 at the S.R. 92/S.R. 35 intersection operates at LOS A.

Congestion and safety issues in the vicinity of the intersection of S.R. 92/S.R. 35 have been the subject of ongoing study by Caltrans. In 2000, Caltrans widened and improved a 1.8-mile segment of eastbound S.R. 92 between Pilarcitos Creek Road and S.R. 35 to provide a continuous uphill climbing lane for slow-moving trucks and other traffic, a median barrier, retaining walls, and an extensive drainage system.[6] Similarly in 2000, Caltrans analyzed an uphill slow-vehicle lane on westbound S.R. 92 from I-280 to S.R. 35 to upgrade the existing road to current design standards in response to the safety and operational problems incurred as a result of the traffic

2 Caltrans, *2017 Traffic Volumes on California State Highways*, 2018. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.
3 Ibid.
4 Ibid.
5 CHS Consulting Group, *State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report*, July 2017.
6 Caltrans, *Transportation Concept Report State Route 92*, September 2016.

queues formed by slow-moving vehicles.[7] The project evaluated by Caltrans includes a grade-separation structure to replace the existing at-grade intersection at S.R. 35/S.R. 92 (south). Although Caltrans implemented the eastbound S.R. 92 uphill climbing lane, the agency did not develop the westbound climbing lane and grade-separated crossing.

In 2002, Caltrans further evaluated modifying the S.R. 92/S.R. 35 intersection to develop an at-grade signalized intersection, a grade-separated unsignalized intersection, or a roundabout to improve traffic flows. The report identifies the grade-separated alternative as the superior option because of its effectiveness at reducing delays and providing for safer pedestrian and cyclist crossing. The report suggests that the at-grade signalized intersection and the roundabout could present safety issues for pedestrians and bicyclists, given its location at the crest of a steep grade, especially in foggy weather.[8]

In 2008, Caltrans again considered adding a traffic signal at the S.R. 92/S.R. 35 intersection due to LOS F conditions for vehicles northbound on S.R. 35 turning left to westbound S.R. 92 (during AM and PM peak hour), and LOS C (PM peak hour) to LOS F (AM peak hour) for northbound vehicles on S.R. 35 turning right to eastbound S.R. 92. Citing the potential for intersection queueing, which would worsen conditions for eastbound and westbound S.R. 92 traffic, the report does not recommend signalizing the intersection. Caltrans concluded that signalizing the intersection without providing additional lanes would not improve operation of the S.R. 92/S.R. 35 intersection and would worsen conditions at the adjacent intersection at Lifemark Road/S.R. 92.[9]

As part of the update to its local coastal program, San Mateo County published the Connect the Coastside report evaluating ways to address transportation deficiencies to and along the coast between Devil Slide and Half Moon Bay, and on S.R. 92 between Half Moon Bay and I-280. Released in 2020, the draft report identifies traffic and bicycle safety issues along S.R. 92, including near its intersection with S.R. 35 in the project vicinity. The report recommends Class II bicycle lanes and a climbing/passing lane along S.R. 92 east of Half Moon Bay to improve bicyclist and motorist safety.[10] The report also recommends roundabouts at the S.R. 35 (north) and S.R. 92 intersection, east of the project area, and the intersection of S.R. 35 (south) and S.R. 92 in the project vicinity.

In the 2016 Transportation Concept Report for S.R. 92, Caltrans advances its 25-year concept for S.R. 92. Between S.R. 1 and I-280, Caltrans intends to maintain a two- to four-lane conventional highway and support the Connect the Coastside plan. As items warranting further study, the report identifies a possible roundabout at the S.R. 35/S.R. 92 intersection for operational and safety benefits. No such further study has been undertaken to date. The Transportation Concept

7 Caltrans and U.S. Department of Transportation, Federal Highway Administration, *Route 92 Uphill Slow Vehicle Lane / Safety Improvements Initial Study / Environmental Assessment*, October 2000.

8 Seriani, Hanibal D., Caltrans District Branch Chief, Office of Highway Operations, memorandum to Joe Hurley, Caltrans District Branch Chief, P/D Peninsula, re: Operational Analysis for Route 92/35 intersection modification in San Mateo County, April 15, 2002.

9 Hall, Lance, Caltrans Office of Highway Operations, memorandum to Katie Yim, Caltrans District Branch Chief, Office of Traffic, re: Proposed Signal at State Route 35/State Route 92 intersection, September 11, 2008.

10 County of San Mateo, *Connect the Coastside: San Mateo County Midcoast Comprehensive Transportation Management Plan*, Draft Report dated January 15, 2020.

Report also identifies consideration of an uphill slow vehicle lane on S.R. 92, westbound from I-280 to S.R. 35. The approximately 2.3-mile slow vehicle lane would provide safety benefits and traffic queue relief from trucks and other slow vehicles heading westbound on S.R. 92, similar to the eastbound climbing lane on the other side of the S.R. 35 summit.[11]

4.4.1.2 Pedestrian and Bicycle Facilities and Public Transit Service

In the project vicinity, neither S.R. 35 nor S.R. 92 provides pedestrian facilities (sidewalks and crosswalks) or bikeways. Shoulders are present along some segments of both highways, but the shoulders are narrow or discontinuous in some locations from vegetation and roadway width constraints. In general, pedestrian activity in the area is minimal and limited to recreational users of nearby trails and paths who were assumed to travel to the area by automobile, based on surveys of comparable trails within the same regional trail system as that of the project.[12] Bicyclists routinely share the roadways with automobiles or use narrow road shoulders along S.R. 92 and S.R. 35 and connecting roadways in the project vicinity.

The only public transit service operating near the project is Route 294, operated by the San Mateo County Transit District (Samtrans), which connects San Mateo (Hillsdale) and Half Moon Bay via S.R. 92. Stops are provided in each direction at the northern end of the proposed southern skyline ridge trail, at the S.R. 92/Lifemark Road intersection in the westbound direction, and at the S.R. 92/ S.R. 35 intersection in the eastbound direction.

4.4.2 Regulatory Framework

4.4.2.1 Federal Regulations

No federal regulations pertaining to transportation impacts are applicable to the project.

4.4.2.2 State and Local Regulations

Transportation analysis in California is guided by policies and standards set at the state level by Caltrans and at the local level by jurisdictional agencies such as the City/County Association of Governments of San Mateo County, the designated Congestion Management Agency for San Mateo County. Local jurisdictions regulate speed limits and other driving standards on local roadways. The goal of state and local plans and policies related to transportation is to prepare for future growth and the vehicular, transit, pedestrian, and bicycle travel demand associated with that growth. However, Caltrans and local jurisdictions require issuance of encroachment permits, as well as preparation of transportation management plans/traffic control plans, when work during project construction would occur within the right-of-way of state and/or local roadways.

CEQA section 21099(b)(1) requires that the State Office of Planning and Research develop revisions to the CEQA Guidelines establishing criteria for determining the significance of project

11 Caltrans, *Transportation Concept Report State Route 92*, September 2016.
12 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

transportation impacts that promote the "reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." CEQA section 21099(b)(2) states that upon certification of the revised CEQA Guidelines for determining transportation impacts pursuant to section 21099(b)(1), automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, shall not be considered a significant impact on the environment under CEQA.

In January 2016, the office of planning and research published for public review and comment a Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA[13] (proposed transportation impact guidelines) recommending that transportation impacts for projects be measured using a vehicle miles traveled metric. *Vehicle miles traveled* measures the amount and distance that a project might cause people to drive, accounting for the number of passengers within a vehicle.

The office of planning and research's proposed transportation impact guidelines provide substantial evidence that vehicle miles traveled is an appropriate standard to use in analyzing transportation impacts to protect environmental quality and a better indicator of greenhouse gas, air quality, and energy impacts than automobile delay. Acknowledging this, San Francisco Planning Commission Resolution 19579, adopted on March 3, 2016:

- Found that automobile delay, as described solely by LOS or similar measures of vehicular capacity or traffic congestion, shall no longer be considered a significant impact on the environment pursuant to CEQA because it does not measure environmental impacts and therefore it does not protect environmental quality.
- Directed the Environmental Review Officer to remove automobile delay as a factor in determining significant impacts pursuant to CEQA for all guidelines, criteria, and list of exemptions, and to update the Transportation Impact Analysis Guidelines for Environmental Review and Categorical Exemptions from CEQA to reflect this change.
- Directed the Environmental Planning Division and Environmental Review Officer to replace automobile delay with vehicle miles traveled criteria that promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses consistent with the CEQA Guidelines.

Planning Commission Resolution 19579 became effective immediately for all projects that have not received a CEQA determination and all projects that have previously received CEQA determinations but require additional environmental analysis. In addition, the Secretary of the Natural Resources Agency certified updated CEQA guidelines in December 2019 that removed automobile delay as a significant impact on the environment. Accordingly, this EIR does not contain a discussion of automobile delay impacts, but rather evaluates potential effects related to vehicle miles traveled and induced automobile travel.

[13] State of California, Governor's Office of Planning and Research, *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA*, January 20, 2016, *http://opr.ca.gov/docs/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf*, accessed December 18, 2018.

4.4.3 Impacts and Mitigation Measures

4.4.3.1 Significance Criteria

San Francisco Administrative Code Chapter 31 directs the department to identify environmental effects of a project using as its base the environmental checklist form set forth in Appendix G of the CEQA Guidelines. As it relates to transportation and circulation, Appendix G asks whether the project would:

- Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b);
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses; or
- Result in inadequate emergency access.

The department uses significance criteria to facilitate the transportation analysis and address the Appendix G checklist. The department separates the significance criteria into construction and operation. Given the project characteristics, some of these significance criteria are grouped or separated out in Section 4.4.3.4, *Impact Analysis*.

Construction

Construction of the project would have a significant effect on the environment if it would require a substantially extended duration or intense activity; and the effects would create potentially hazardous conditions for people walking, bicycling, or driving, or public transit operations; or interfere with accessibility for people walking or bicycling or substantially delay public transit.

Operation

The operational impact analysis addresses the following five significance criteria. A project would have a significant effect if it would:

- Create potentially hazardous conditions for people walking, bicycling, or driving or public transit operations;
- Interfere with accessibility of people walking or bicycling to and from the project site, and adjoining areas, or result in inadequate emergency access;
- Substantially delay public transit;
- Cause substantial additional vehicle miles traveled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (i.e., by adding new mixed-flow travel lanes) or by adding new roadways to the network; or
- Result in a loading deficit and the secondary effects would create potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit.

4.4.3.2 Approach to Analysis

Because of the location and nature of the project, there would be no impacts related to the following significance criteria for the reasons presented below; therefore, these criteria are not discussed further.

- ***Result in Inadequate Emergency Access during Project Operations.*** The project would not permanently change the existing or planned transportation network and would not permanently affect emergency access on area roadways. Therefore, this significance criterion is not applicable to proposed operations and is only discussed below (see Impact TR-2) as it applies to project construction activities.

For informational purposes, the City/County Association of Governments of San Mateo County 2017 Congestion Management Program[14] requires that local jurisdictions notify the association of governments at the beginning of the CEQA process of all development applications or land use policy changes that are expected to generate a net 100 or more peak-hour trips on the congestion management program network. San Mateo County does not require the preparation of traffic impact analysis for land use projects that generate less than 500 trips per day or 100 peak-hour trips at an intersection.[15] The visitation estimates indicate that the project, under the proposed access program and variants, would generate fewer than 500 trips per day (see discussion of Impact TR-4, below). Furthermore, the majority of trail users would travel to the area on weekends and during off-peak-hour times on weekdays and would therefore generate fewer than 100 peak-hour trips. Additionally, the congestion management program states that its traffic impact analysis policy applies to general plan updates, specific area plans, and modifications to the congestion management program roadway network, and the project does not fit any of those categories. Thus, project operation would not conflict with congestion management programs for San Mateo County roads.

Project Impacts

The analysis considers the potential short-term effects of construction—including those on pedestrian and bicycle facilities, and emergency vehicle access. The construction-related information used for the analysis is based on current project specifications, including construction durations.

Project construction activities would result in a temporary increase in vehicle trips on roads in the project area over the anticipated 12-month project construction period. The SFPUC would construct project components north and south of S.R. 92 concurrently and conduct all construction on weekdays between 7 a.m. and 6 p.m., and Saturdays between 9 a.m. and 5 p.m., if approved by local agencies. The SFPUC does not anticipate any nighttime construction. The analysis of construction-related traffic impacts below considers the estimated number of daily commute, delivery, and haul trips. The proposed staging areas would provide sufficient capacity to

[14] City/County Association of Governments of San Mateo County, *San Mateo County Congestion Management Program 2017*, January 12, 2018, *http://ccag.ca.gov/wp-content/uploads/2018/03/2017-CMP-Final-v2.0.pdf,* accessed July 17, 2019.

[15] County of San Mateo, Department of Public Works, Roadway Services, *Traffic Impact Study Requirements*, September 1, 2013.

accommodate the anticipated parking demand for construction-worker vehicles, estimated to be a maximum of approximately 20 vehicles per day. The analysis also considers the potential long-term effects of project implementation, including those on traffic safety hazards, and safety of pedestrian and bicycle facilities.

4.4.3.3 Impact Summary

Table 4.4-1 summarizes the impacts of the project related to transportation and circulation. The impact summary table provides separate significance determinations for the proposed access program and variants.

TABLE 4.4-1
SUMMARY OF IMPACTS – TRANSPORTATION AND CIRCULATION

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact TR-1: Construction of the project would not require a substantially extended duration or intense activity.	LS	LS	LS	LS
Impact TR-2: Project construction activities would not result in inadequate emergency access.	LS	LS	LS	LS
Impact TR-3: Project construction activities would not result in potentially hazardous conditions for vehicles, bicyclists, and pedestrians.	LS	LS	LS	LS
Impact TR-4: Operation of the project would not cause a substantial adverse change in accessibility, public transit, vehicle miles traveled, or loading.	LS	LS	LS	LS
Impact TR-5: Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts and could create potentially hazardous conditions between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92. (Significant and Unavoidable with Mitigation)	SUM	LS	SUM	SUM
Impact C-TR-1: The project, in combination with past, present, and probable future projects, would not substantially affect transportation and circulation.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
SUM = Significant and Unavoidable impact with implementation of feasible mitigation

4.4.3.4 Impact Analysis

The following analyses discuss impacts related to the significance criteria in Section 4.4.3.1, *Significance Criteria*, above. For criteria addressed in the management plan EIR, the analysis tiers off of and cross-references those analyses. Therefore, relevant portions of the management plan EIR's impact analyses are incorporated by reference.

Construction Impacts

The management plan EIR does not address transportation and circulation impacts associated with construction at a project level. Therefore, the following discussion of project construction-period impacts is unique to the project as proposed. It addresses construction transportation and circulation impacts in light of the site-specific and project-level information that has become available (or been developed) since management plan EIR certification in 2001.

Impact TR-1: Construction of the project would not require a substantially extended duration or intense activity. (Less than Significant)

Construction Traffic

Construction traffic would result in short-term increases in traffic volumes on S.R. 35, S.R. 92, and I-280. With the addition of project-related construction vehicle traffic to existing roadway volumes without a corresponding increase in the capacity of the roadway, there could be increased congestion and delay for vehicles. Construction truck traffic could temporarily reduce roadway capacities due to the slower travel speeds and larger turning radii of trucks. The impacts of construction traffic would be most noticeable in the immediate vicinity of the project area.

In order to determine the potential transportation-related effects of project construction activities, the project's transportation analysts derived the volume of construction-related traffic based on estimated construction equipment needs provided by SFPUC staff. Construction of the project trails and trail amenities would generally require clearing, grubbing, grading, excavation, and compaction; limited paving; and installation of retaining and drainage structures, restrooms, signage, and fencing.

During construction, traffic activity to and from the project site could be more variable from one day to the next, depending on what types of construction activities are taking place and where. An overview of the construction requirements for the project is presented in Table 2-1, of Chapter 2, Project Description. As presented in Table 2-1, project construction is estimated as requiring up to two construction crews working at the same time; the size of each crew would range from 5 to 10 workers. Under the proposed access program and variant 1, construction of the universal access loop trail and associated facilities north of S.R. 92 would require one crew of up to 10 workers for approximately four months. Under variants 2 and 3, fencing construction would require an additional four to eight months. Under the proposed access program and variants, construction of the southern skyline ridge trail and associated facilities south of S.R. 92 would require one crew of up to 10 workers for approximately 12 months.

Upon completion of the Fifield-Cahill ridge trail improvements, the crew assigned to that work could be reassigned to work on the southern skyline ridge trail improvements. Under that scenario, two crews totaling up to 20 people could be working on the southern skyline ridge trail simultaneously for up to eight months. This would be the maximum number of construction workers anticipated to be working on the southern skyline ridge trail at any given time. Reflecting the expectation that some workers also would make midday trips, this analysis estimates that the 20 workers would generate up to 60 one-way vehicle trips per day. As indicated in Table 2-1, construction activity would require up to six trucks per day delivering material to the work site, and up to 40 trucks per day to haul material to and away from the work site. Reflecting the expectation that no delivery trucks would also be haul trucks, and the conservative assumption that delivery trips and haul trips would occur on the same days, it is estimated that there would be up to 92 daily one-way truck trips.

Heavy vehicles such as trucks are larger, heavier, slower, and less maneuverable than passenger cars, and typically have more noticeable effects on traffic flow. These effects can be simulated by applying a *passenger car equivalent factor*, which attempts to capture the effects of a given type of heavy vehicle by converting it to an equivalent number of passenger cars. For trucks, a typical passenger car equivalent factor is on the order of 2 to 3. Even when accounting for the passenger car equivalent factor, however, the worst-case effect of construction-related traffic activity would be no more than 336 one-way passenger vehicle trips.

As described above, the traffic volume on I-280 at the junction with S.R. 92 near the project area is about 104,000–109,000 vehicles per day, and the addition of up to 92 truck and 60 passenger vehicle trips per day would represent a minimal increase (less than 0.5 percent). The traffic volume on S.R. 92 in the project area is about 24,700–26,500 vehicles per day, and the addition of up to 92 truck and 60 passenger vehicle trips per day likewise would represent a minimal increase (about 1.4 percent). The magnitude of these increases is within the range of typical daily variation in traffic levels (usually on the order of ±5 percent) that might be expected on the major roadways serving the project site, and transportation and circulation conditions on these roadways would remain substantially similar to current conditions.

The traffic volume on S.R. 35 in the project area is about 3,150 vehicles per day north of S.R. 92 and about 2,300 vehicles per day south of S.R. 92, and the addition of up to 92 truck and 60 passenger vehicle trips per day would represent an increase of up to about 15 percent on S.R. 35 south of S.R. 92. That percent increase in traffic volume (greater than the above-cited ±5 percent typical daily variation in traffic levels) would be noticeable to the average motorist. However, the daily traffic capacity of S.R. 35, a two-lane highway with a capacity of 2,800 vehicles per hour south of S.R. 92,[16] is adequate to accommodate the increase in traffic, which would mostly occur during non-peak traffic hours. In summary, construction traffic generated by the project would not require a substantially extended duration or intense activity that would affect transportation and circulation conditions in the project vicinity. Therefore, impacts related to short-term traffic increases on I-280, S.R. 92, and S.R. 35 during construction of the project would be less than significant.

[16] City and County Association of Governments of San Mateo County, *San Mateo County Congestion Management Program 2017*, Appendix B: Traffic Level of Service Calculation Methods, January 12, 2018.

As stated above, these estimates reflect the most conservative scenario of maximum traffic activity overlap. In reality, the potential for overlap between different activity types would be less than that assumed, and construction-related traffic activity would generally be spread out over the course of the entire day as workers arrive at the site from or depart the site for offsite destinations.

Construction activities would generally take place within SFPUC right-of-way (i.e., outside of the public right-of-way along S.R. 35 and S.R. 92) and would not substantially conflict with traffic, transit, bicycle, or pedestrian access or circulation along these facilities. Newly constructed service roads connecting to S.R. 35 would be sited to provide adequate sight distance for heavy vehicles to safely enter and exit the construction site. The use of a crane to install the prefabricated pedestrian bridge proposed for seasonal drainage crossing along southern skyline ridge trail would require intermittent closure of the northbound lane of S.R. 35 for up to three days for site preparation, bridge delivery, crane setup, bridge placement, and site cleanup and materials removal. Any activities taking place during the week or weekend within the public right-of-way along S.R. 35 and S.R. 92 or requiring temporary traffic controls such as lane closures would be coordinated directly with Caltrans (through preparation of a Caltrans-approved transportation management plan as part of an application for an encroachment permit) to ensure traffic safety and minimize disruptions to traffic, transit, bicycle, or pedestrian access or circulation along these facilities.

Construction of the Fifield-Cahill ridge trail improvements might require closure of the trail for short periods during the 12 months of construction activities. However, such closures would be temporary and only affect access for a relatively small number of current trail users (about 866 people on average visit the trail annually[17]). As the proposed southern skyline ridge trail is intended to support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal Bay Area Ridge Trail network, there are no existing trails within the boundaries of construction activities associated with that project component, and no disruptions to trail access for equestrians, bicyclists, or pedestrians would result from project construction.

The SFPUC would require its Standard Construction Measures (traffic control measures) be included in the construction specifications to maintain transportation and circulation on roadways affected by construction. These requirements include measures such as flaggers, construction warning signs, scheduling truck trips during non-peak hours, and coordinating with local emergency responder to maintain emergency access. Implementation of these standard construction measures would serve to further reduce the project's impact on transportation and circulation. Given these considerations, construction of the project under the proposed access program and variants would result in less-than-significant impacts on transportation and circulation.

Mitigation: None required.

[17] CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill and southern skyline ridge trails would have a less-than-significant impact related to conflicts with plans and policies that establish measures of effectiveness for the performance of a circulation system. No mitigation is required.

Impact TR-2: Project construction activities would not result in inadequate emergency access. (Less than Significant)

Project construction activities would be conducted east of (i.e., not within the travel lanes of) S.R. 35 and north of S.R. 92 (at Cemetery Gate and Fifield-Cahill ridge trail). Construction-related traffic increases associated with project activities would not be substantial (maximum of 92 truck and 60 one-way vehicle trips per day) and would not result in inadequate emergency access along S.R. 35. Project activities would not require full highway or other roadway closures, and emergency vehicles would have continuous access to all roadways in the project vicinity. In some instances, traffic flow on S.R. 35 could be temporarily interrupted for short periods of time (i.e., typically less than five minutes) to accommodate large construction vehicles accessing the project work sites, or due to the closure of the northbound lane of S.R. 35 to accommodate prefabricated bridge delivery and installation. However, emergency response vehicles would have continuous access and would not be precluded during temporary interruptions of traffic flow because travel lanes would be reopened, and construction vehicles would move to the side of the road to accommodate any passing emergency vehicles.

As explained for Impact TR-1, SFPUC Standard Construction Measures (traffic control measures) would be included in the construction specifications to allow for unimpeded emergency access on roadways affected by construction. These measures would serve to further reduce the project's impact on emergency access. Therefore, construction of the project under the proposed access program and variants would result in less-than-significant impacts on emergency access. As noted in Section 4.4.3.2, *Approach to Analysis*, project operations would have no impact related to inadequate emergency access.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would have a less-than-significant impact related to inadequate emergency access. No mitigation is required.

Impact TR-3: Project construction activities would not result in potentially hazardous conditions for vehicles, bicyclists, and pedestrians. (Less than Significant)

Construction vehicles traveling to and from the project area would share the roadway with other vehicles as well as with bicyclists. The use of S.R. 35 to access the project work sites during construction could increase potential conflicts between construction vehicles (with slower speeds and wider turning radii than autos) and automobiles and bicyclists. The greatest increase in the number of project-related construction vehicles using S.R. 35 to access the project work sites would occur on weekdays, when there would be no more than six delivery trucks, 40 haul trucks, and 20 worker vehicles on a given day traveling to and from the site.

As noted above in Section 4.4.3.2, *Approach to Analysis*, all construction would be conducted on weekdays between 7 a.m. and 6 p.m., and on Saturdays between 9 a.m. and 5 p.m. The potential for conflicts would be limited because five out of the six days per week that trip-generating project construction activities would occur would be weekdays, when there are fewer bicyclists present than on weekend days. As noted for Impact TR-1, SFPUC's Standard Construction Measures (traffic control measures) would be included in the construction specifications to maintain traffic and bicycle circulation on roadways affected by construction. These measures would serve to further reduce the project's impact on traffic safety. In addition, construction contractors would be required to prepare a Caltrans-approved transportation management plan[18] for work, including temporary traffic controls, within the public right-of-way along S.R. 35 and S.R. 92, to ensure traffic safety and minimize disruptions to traffic, transit, bicycle, or pedestrian access or circulation along these facilities. Given these considerations, construction of the project under the proposed access program and variants would result in less-than-significant safety impacts for vehicles, bicyclists, and pedestrians.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would have a less-than-significant impact on the safety of public roadways for vehicles, bicyclists, and pedestrians. No mitigation is required.

Operational Impacts

Both the programmatic and project-level analyses contained in the management plan EIR acknowledge that under the Peninsula Watershed Management Plan, there could be increased public use of the watershed, which could result in an increase in vehicular traffic on roadways serving the watershed. Specifically, the amount of vehicular traffic would be influenced by the

[18] A transportation management plan is an approach for alleviating or minimizing work-related traffic delays by the effective application of traditional traffic handling practices and other strategies, which may include public awareness campaigns, motorist information, accident management, construction methods, demand management, and alternative route planning (Caltrans, 2015. Transportation Management Plan Guidelines).

availability of parking at or near trail access points. Alternative level-of-access schemes would generate different levels of vehicular traffic, ranging from that generated by unrestricted public access to watershed trails, or by annual permit, or by docent-led small hiking groups.[19] The management plan EIR concludes that increases in vehicular traffic would not be noticeable within the daily fluctuations of traffic volumes on area roadways, and the impact to traffic flow conditions would be less than significant.

The management plan EIR also concludes that traffic safety impacts associated with turns between S.R. 92 and parking areas would be significant, but that implementation of Project-Level Mitigation Measures J.1 through J.4 would reduce effects to traffic safety to a less-than-significant level.[20] These measures outline several actions, such as restricting parking duration to encourage turnover of trail users, installing advance warning signs upstream of parking lot access driveways, and prohibiting left turns from S.R. 92 into parking lots during peak-use times of day. These measures have been considered and, where directly applicable to the project under consideration, refined to reflect additional site-specific and project-level details that the SFPUC has developed since management plan EIR certification.

As described in Chapter 2, Project Description, the SFPUC is considering a proposed access program and three variants. The proposed access program would implement a docent program on the Fifield-Cahill ridge trail and unsupervised/restricted access on the southern skyline ridge trail. Variant 1 would be a continuation and expansion of the existing program, allowing docent-led groups of up to 20 people, three times per day, and four times per week, scheduled in advance by reservation, with daily limits of 60 people. Variant 2 would allow unsupervised access for approximately eight hours per day during daylight hours, with no limit on the number of visitors. Variant 3 would be similar to access program variant 2, but access would require a permit. Further detail is provided below in the impact discussion.

Upon the completion of construction, typical maintenance activities would include periodic (e.g., monthly) inspection of trail infrastructure (e.g., trail and parking lot surfaces, retaining walls, and drainage facilities), with more frequent inspection of restroom and fences (i.e., weekly). For the proposed access program and variants, this EIR conservatively assumes up to one additional staff person and 10 volunteers could be required to support project operations. Considering the infrequent occurrence and the minimal number of staff/volunteers needed to perform maintenance activities, maintenance is not considered in the discussion of project operations below.

Impact TR-4: Operation of the project would not cause a substantial adverse change in accessibility, public transit, vehicle miles traveled, or loading. (Less than Significant)

Once operational, the project would increase traffic volumes on area roadways from visitor motor vehicle trips; work trips by SFPUC docents (under the proposed access program and variant 1); as well as maintenance trucks to service the trails, fencing, and restrooms. Visitor motor vehicle trips

19 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.J, Transportation and Access (p. III.J-3) and Section V.J, Transportation and Access (p. V-39).

20 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section VI.J, Transportation and Access (p. VI-5).

would represent the greatest contributor to traffic volume increases. As discussed in Section 2.7.1, Trail Access Management Program and Visitation, of Chapter 2, Project Description, project visitation would vary by access program, based upon level of access restriction. As explained in that section, a program under which visitation were restricted to docent-led access would result in the fewest number of visitors (see Section 2.7.1.2, *Access Program Variant 1 [Docent Program]*), whereas a program under which visitation were unsupervised and unrestricted would result in the greatest number of visitors (see Section 2.7.1.3, *Access Program Variant 2 [Unsupervised/Unrestricted Access]*). An access program with some restrictions, such as the proposed access program (docent-led access along Fifield-Cahill ridge trail; unsupervised/restricted access along southern skyline ridge trail) would have visitor traffic volumes similar to but slightly lower than unsupervised/ unrestricted access. As discussed below, increases in visitor traffic volumes would not be substantial under any access program configuration. Therefore, this section presents a quantitative analysis of traffic volumes associated with the lowest (docent-led) and highest (unrestricted/ unsupervised) potential visitation for the access programs under consideration. This approach captures the range of potential traffic volume increases across all access program configurations, including the proposed access program.

Access Program Variant 1 (Docent Program)

Under variant 1, visitation would be limited to 60 people per day, 240 per week, 12,480 per year, per trail segment (i.e., Fifield-Cahill ridge trail and southern skyline ridge trail, as applicable).[21] Taking into account that docent-led access would increase the number of docent programs from one to two (one for each trail segment), and the increase in the number of days per week that the docent program would operate (from three to four), the maximum allowable number of trail visitors would more than double from 9,360 to 24,960 per year. Considering that existing trail usage averages approximately 866 visitors per year, or roughly 9 percent of allowable visitation, the total number of average annual visitors with docent-led access would likely be approximately 2,309. This represents an increase of 1,443 average annual visitors, which would equate to an average of approximately seven new visitors per day of operation on the Fifield-Cahill ridge trail or the southern skyline ridge trail.

Access would be provided via designated trailheads and watershed access points (e.g., Portola Gate, Cemetery Gate, and proposed trailhead at S.R. 92 and S.R. 35). Trail users and docents would be instructed to park within designated parking areas (e.g., proposed 50-car parking lot near Cemetery Gate, existing Skyline Quarry parking lot, proposed 20-car parking lot near the Caltrans vista point on S.R. 35, existing Sneath Lane parking lot).

Considering that most, if not all, of the seven new average daily trail visitors would be traveling to/from the project area in vehicles carrying more than one trail visitor, and that the vehicles would

[21] Under the current docent-led access program, far fewer people than the maximum annual allowance (i.e., 9,360 people per year, not including docents) have actually visited the watershed. Annual visitation data maintained by the SFPUC from 2003 to 2017 indicate that average annual trail use during this period was 866 people per year, including docents. Peak usage was in 2004 with 1,317 people, including docents. Total usage during this 14-year period was 12,995, of which 11,088 were visitors (i.e., not docents).

San Francisco Public Utilities Commission, *Annual Fifield-Cahill Ridge Trail Usage August 23, 2003 Through December 31, 2017*, 2017, Table: Number of Trail Participants/Docents by Event Type.

be spread across four visitor parking lots, the number of new vehicle trips generated by a docent-led access program traveling on local roadways in the project area would likely be less than five.

While visitation patterns under the existing docent program indicate current annual visitation is about 9 percent of the maximum allowable, it is possible that maximum visitation under variant 1 could be realized on a given day. Under this conservative scenario, the number of daily project-related vehicle trips on local roadways could increase from roughly 6 to 115. Even if daily maximum visitation were realized under variant 1 (i.e., 120 visitors – 60 visitors for each trail segment), visitors would likely arrive/depart two or more to a vehicle, and those vehicle trips would be spread across the eight-hour period that the trails are open and across multiple parking facilities. Under this scenario, the maximum new daily one-way vehicle trips would be less than the number of daily vehicle trips evaluated above in the discussion of construction impacts.[22] Therefore, project operation under variant 1 would not substantially increase the current traffic volumes on area roadways, thereby maintaining accessibility for vehicular access and Samtrans Route 294 operations. No on-street loading currently occurs on any of the study roadways, nor would project operation under variant 1 introduce any on-street loading, as passenger loading activities would occur in the existing and two proposed designated parking lots.

The estimated average trip length of 18.9 miles per visitor under existing conditions would not be expected to change under the variant 1, because the estimates are based upon reports from current Fifield-Cahill ridge trail visitors under the existing docent program and variant 1 visitation restrictions would not substantially change relative to the existing program.[23] Nevertheless, a docent-led access program would not increase physical roadway capacity or cause substantial additional vehicle miles traveled because the increase in vehicle trips resulting from visitation described for variant 1 (i.e., between roughly 5 and 115 new vehicle trips) would not be substantial in relation to existing traffic volumes on study area roadways, as described above in Section 4.4.1.1, *Roadway Network*. For the reasons described above, the impact would be less than significant.

Access Program Variant 2 (Unsupervised/Unrestricted Access)

With variant 2, visitation would be allowed seven days per week, for approximately eight hours per day during daylight hours, with no restrictions on the number of trail users. As noted above, of all access programs under consideration for the project, unsupervised/unrestricted access would generate the largest number of visitors. Annual visitation under variant 2 could be up to approximately 50,020 people per year.[24] While visitation would vary based upon season and weather conditions, average weekly visitation would likely increase to roughly 960 people per week. A visitation study commissioned by the planning department which collected data from other nearby public open space lands with similar recreational opportunities (Golden Gate National Recreation

22 The estimated person trips were converted to estimated vehicle trips using an automobile occupancy of 2.1 (persons per vehicle), which is the average vehicle occupancy of trips made for social and recreational purposes according to the Bureau of Transportation Statistics (CHS Consulting Group, 2018).

23 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

24 Ibid.

Area's Sweeney Ridge, SFPUC Peninsula Watershed's Fifield-Cahill Ridge, and Midpeninsula Regional Open Space District's Purisima Creek Redwoods Open Space Preserve), found that approximately 43 percent of visitors would likely access the trails on weekends and the remaining 57 percent on weekdays.[25] Accordingly, on a peak weekend day, unsupervised/ unrestricted access would generate a maximum of approximately 206 visitors, or up to approximately 200 new daily trail visitors compared to average daily visitation levels under the existing docent program. As noted previously, visitors would likely arrive/depart two or more to a vehicle, and those vehicle trips would be spread across the eight-hour period that the trails are open and across multiple parking facilities. At a maximum, this would result in 190 new daily one-way vehicle trips, which is similar to the number of daily vehicle trips evaluated above in the discussion of construction impacts.[26] For the same reasons identified in Impact TR-1, project operation under variant 2 would not substantially increase the current traffic volumes on area roadways, thereby maintaining accessibility for vehicular access and Samtrans Route 294 operations. No on-street loading currently occurs on any of the study roadways, nor would project operation under variant 2 introduce any on-street loading, as passenger loading activities would occur in the existing and two proposed designated parking lots.

The project's estimated average trip length of 12 miles per visitor for unsupervised/unrestricted access would be reduced relative to the estimated average trip length under existing conditions.[27] Furthermore, unsupervised/unrestricted access would not increase physical roadway capacity or cause substantial additional vehicle miles traveled because the increase in vehicle trips resulting from visitation described above (i.e., 190 new vehicle trips) would not be substantial in relation to existing traffic volumes on study area roadways, as described above in Section 4.4.1.1, *Roadway Network*. For the reasons described above, the impact would be less than significant.

All Access Programs Summary

As explained above, traffic volumes for the access program configurations with the lowest and highest potential visitation (which correspond to docent-led access and unsupervised/unrestricted access, respectively) would not substantially increase in traffic volumes. The access programs with some restrictions, such as the proposed access program and variant 3, would have visitor traffic volumes similar to but slightly lower than the highest potential visitation under variant 2. As explained, increases in visitor traffic volumes would not be substantial under any access program configuration.

The estimated average trip length of project visitors would be expected to be similar (under variant 1) or reduced (under proposed access program and variants 2 and 3), relative to the average trip length under existing conditions (18.9 miles per visitor).[28] Furthermore, the project would not increase physical roadway capacity or cause substantial additional vehicle miles

25 Ibid.

26 The estimated person trips were converted to estimated vehicle trips using an automobile occupancy of 2.1 (persons per vehicle), which is the average vehicle occupancy of trips made for social and recreational purposes according to the Bureau of Transportation Statistics (CHS Consulting Group, 2018).

27 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

28 Ibid.

traveled because the range of the increase in vehicle trips resulting from visitation described above for the project (i.e., a maximum of between 115 and 190 new vehicle trips) would not be substantial in relation to existing traffic volumes on study area roadways, as described above in Section 4.4.1.1, *Roadway Network*. Therefore, traffic volumes under the project, regardless of which access program were selected (i.e., proposed access program or variants 1 through 3), would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Operation of the project with the proposed access program along the Fifield-Cahill and southern skyline ridge trails would not substantially increase the current traffic volumes on area roadways; the impact would be less than significant. Mitigation is not required.

Impact TR-5: Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts and could create potentially hazardous conditions between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92. (Significant and Unavoidable with Mitigation)

Hazardous Conditions for Vehicles

During project operation, trail visitors turning left from eastbound S.R. 92 onto Lifemark Road to access the two proposed parking areas in the vicinity of Cemetery Gate would use the existing left-turn lane. This is no different than the existing condition as there is a trailhead at the Skylawn Cemetery for the existing easement section of the Ridge Trail. Like existing conditions, left turns onto S.R. 92 from Lifemark Road would have to be made in a gap in the traffic streams of both eastbound and westbound directions. This would be complicated by the fact that eastbound vehicles on S.R. 92 come from both S.R. 92 west of S.R. 35 and from S.R. 35 south of S.R. 92. Vehicles making those left turns onto S.R. 92 could be delayed, which could cause some drivers to attempt to turn through the traffic streams, thus increasing the potential for vehicular conflicts with the addition of the proposed project, relative to existing conditions.

In addition, there would be no separate left-turn lane for drivers to turn from southbound S.R. 35 into the proposed 20-vehicle parking lot. Left turns onto S.R. 35 from this parking lot would have to be made in a gap in the traffic streams from both directions. Vehicles making those left turns onto S.R. 35 could be delayed, during which some drivers might attempt to turn through the traffic streams and increase the potential for conflicts with the addition of the proposed project, relative to existing conditions. These potential delays would not affect access by emergency responders on study area roadways because the responders could use their sirens to bypass any queued vehicles.

The turning movements described above would occur more often on weekends than on weekdays, and more often under variant 2 than under the other access programs. The project

would result in a maximum of between 115 and 190 new daily one-way vehicle trips, depending on the maximum visitation levels permitted under the proposed access program and variants (see discussion above for Impact TR-4). Those vehicle trips would be spread over an eight-hour period when trail access is open, and they would be spread among parking facilities accessed from two different roadway facilities (i.e., S.R. 92 and S.R. 35). Considering the temporal and geographic dispersion of these vehicle trips and the limited number of vehicles attempting to make turns into the proposed parking areas, this analysis does not expect left-turning vehicles to experience uncharacteristic queuing or delays. The addition of these left-turning vehicles would not result in an appreciable increase in safety hazards beyond levels that currently exist for vehicles making these left turns. Therefore, operation of the project under the proposed access program and variants would result in a less-than-significant impact related to hazardous vehicle conditions.

Potentially Hazardous Conditions for Pedestrians, Bicyclists, and Equestrians

With respect to pedestrians, bicyclists, and equestrians, the focus of the safety hazard analysis is at the Lifemark Road/S.R. 92 intersection to the north, and the S.R. 35/S.R. 92 intersection to the south. Parking for the project would be accommodated within the new 20-car parking lot, located immediately south of the existing Caltrans vista point parking area, and accessed from S.R. 35. In this area, the Lifemark Road/S.R. 92 intersection represents the terminus of the Bay Area Ridge Trail segment north of S.R. 92 (i.e., extending from the Fifield-Cahill ridge trail south through Skylawn Memorial Park). The S.R. 92/S.R. 35 intersection is located approximately 600 feet north of the project trailhead and parking lot for the southern skyline ridge trail. The SFPUC does not propose to connect segments of the Bay Area Ridge Trail north and south of S.R. 92, nor does it propose to facilitate or otherwise encourage pedestrian, bicycle, or equestrian crossing of S.R. 92.

Proposed Access Program (Docent Program on Fifield-Cahill Ridge Trail and Unsupervised / Restricted Access on Southern Skyline Ridge Trail) and Variants 2 (Unsupervised / Unrestricted Access) and 3 (Unsupervised / Restricted Access)

Under the proposed access program and variants 2 and 3, with no restrictions on the number of trail users, it is possible that parking demand could occasionally exceed the capacity of the 20-car parking lot, as periodically happens at Purisima Creek Redwoods Open Space Preserve to the south. If this were to occur, visitors might attempt to park illegally on the roadway shoulder on S.R. 35 near the trailhead or at the adjacent 12-car parking lot at the Caltrans vista point. This could create significant hazardous conditions for pedestrians, bicyclists, and equestrians attempting to access the trailhead from offsite parking locations or those traveling along S.R. 35 for other purposes because there are no sidewalks and the roadway would be narrowed due to the presence of parked vehicles. The management plan EIR recognized this potential hazard and included Project-Level Mitigation Measures J.1 and J.4, which generally address this potential condition by imposing a parking time limit of two hours at the Caltrans vista point, and by coordinating with local jurisdictions regarding signage and enforcement of parking restrictions. Mitigation Measure M-TR-5a, Installation of Signage, would more specifically reduce the potentially hazardous condition created by parking overflow. However, implementation of this measure would not be entirely within the SFPUC's control and require coordination with, and be contingent upon, agreement with Caltrans.

In addition, the proposed addition of a new trail segment extending south from a location near the terminus of an existing segment of Bay Area Ridge Trail could create a new demand for trail users (i.e., pedestrians, bicyclists, and equestrians) to cross S.R. 92. Under the proposed access program and variants 2 and 3, it is reasonable to expect that some trail users would want to use both trail segments. Trail users attempting to cross S.R. 92 near its intersections with Lifemark Road or S.R. 35 would create potentially hazardous conditions for them. S.R. 92 carries approximately 26,800 to 28,900 vehicles per day in this area,[29] is congested when traffic volumes are highest during the middle of the day on weekends,[30] and there are currently no traffic signals or pedestrian crossing signals, striping, or signage in this area to convey trail user access across S.R. 92. The potentially hazardous conditions for trail users attempting to cross S.R. 92 would constitute a significant transportation impact.

Implementation of Mitigation Measure M-TR-5a would reduce this impact to some degree by notifying visitors that crossing S.R. 92 is prohibited and dangerous. However, signage alone might not discourage all potential S.R. 92 crossings by trail users. As a result, this measure would not be sufficient on its own to reduce the above-described potentially hazardous conditions related to trail users crossing S.R. 92 under the proposed access program and variants 2 and 3 to less-than-significant levels.

The SFPUC and the San Francisco Planning Department considered several other measures to reduce potential S.R. 92 crossing impacts at this location during project development. Such additional mitigation options included: (1) an at-grade crosswalk with flashing beacon, (2) an at-grade crosswalk with high-intensity beacon, (3) a traffic signal, (4) a roundabout, and (5) a bridge.[31] As noted in Section 4.4.1.1, *Roadway Network*, Caltrans (which owns and manages this intersection) reviewed and provided input on each of these proposals. In addition, the planning department reviewed studies cited below. The planning department rejected options 1 to 3 for the following operational and/or safety reasons:

- ***Enhanced At-Grade Crosswalk/Rectangular Rapid Flashing Beacon*** – High speeds on S.R. 92 discourage a rapid flashing beacon and would not adequately achieve pedestrian, bicyclist, and equestrian safety at this location.[32]
- ***High-Intensity Activated At-Grade Crosswalk Beacon*** – A high-intensity activated beacon would provide a higher level of control than a rapid flashing beacon because vehicles are required to come to a complete stop when the high-intensity activated beacon signal is initiated. However, a high-intensity activated beacon at this location would force queueing traffic, including semitrailer trucks, to stop on a steep inclined grade. If the truck is fully loaded and has to come to a stop, it is likely to roll backward. The steep incline might be challenging for truck drivers and could become a roadway hazard.[33]

29 Caltrans, *2017 Traffic Volumes on California State Highways*, 2018.
30 CHS Consulting Group, *State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report*, July 2017, shows the highway operating at level of service E during these periods.
31 Ibid.
32 Caltrans, Letter from Caltrans to the City and County of San Francisco, re: Southern Skyline Boulevard Ridge Trail Extension – State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report, August 17, 2017.
33 Ibid.

- ***Traffic Signal*** – In 2002 and 2008, Caltrans explored the feasibility of signalizing S.R. 92 and S.R. 35, and this option was not recommended because it could result in queuing on eastbound and westbound S.R. 92 and result in reduced driver sight lines associated with foggy conditions.[34,35]

The bridge crossing and roundabout, both of which the planning department has concluded are potentially feasible mitigation concepts, are described more fully below.

As noted in Section 4.4.1.1, *Roadway Network*, a 2002 Caltrans study found a grade-separated, or bridge, crossing to be operationally superior to signalization or roundabout.[36] The planning department considered S.R. 92 bridge crossing options with landings on the west and east sides of S.R. 35.

The "west" option would consist of a 200-foot-long elevated pedestrian, bicycle, and equestrian bridge across S.R. 92 at the west leg of its intersection with S.R. 35. This option would take advantage of existing elevated topography by bridging the high points on both sides of S.R. 92. While this option would be the least complex and costly of the two options, it would require installation of an additional trail user crossing of S.R. 35 to connect the proposed 20-car parking lot near the Caltrans vista point to the bridge. This additional crossing would be needed to avoid hazard conditions similar to those described for S.R. 92.[37]

The "east" option would consist of an approximately 180-foot-long elevated pedestrian, bicycle, and equestrian bridge across S.R. 92 with a spiral, or "looping," ramp at the east leg of the intersection with S.R. 35. The spiral ramp would be necessary to achieve the gradual slope, or grade, required to enable passage of equestrians, given the substantial elevation difference between the bridge's connection points north and south of S.R. 92. As a result, this option would be more complex and costly but would avoid the need for an additional crossing of S.R. 35.[38] For these reasons, the planning department concluded that the grade-separated crossing with a landing on the east side of S.R. 35 would more effectively reduce the hazard potential.

As described in Section 4.4.1.1, *Roadway Network*, in 2002 Caltrans considered a number of S.R. 92/S.R. 35 intersection designs, including a roundabout.[39] Caltrans did not recommend a roundabout at the time due to reduced sight lines associated with fog and S.R. 92's steep grade at

34 Seriani, Hanibal D., Caltrans District Branch Chief, Office of Highway Operations, memorandum to Joe Hurley, Caltrans District Branch Chief, P/D Peninsula, re: Operational Analysis for Route 92/35 intersection modification in San Mateo County, April 15, 2002.

35 Hall, Lance, Caltrans Office of Highway Operations, memorandum to Katie Yim, Caltrans District Branch Chief, Office of Traffic, re: Proposed Signal at State Route 35/State Route 92 intersection, September 11, 2008.

36 Seriani, Hanibal D., Caltrans District Branch Chief, Office of Highway Operations, memorandum to Joe Hurley, Caltrans District Branch Chief, P/D Peninsula, re: Operational Analysis for Route 92/35 intersection modification in San Mateo County, April 15, 2002.

37 CHS Consulting Group, *State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report*, July 2017.

38 CHS Consulting Group. Memorandum from Celina Lee to Elijah Davidian (ESA) re: Addendum to 2017 State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report, April 2020.

39 Seriani, Hanibal D., Caltrans District Branch Chief, Office of Highway Operations, memorandum to Joe Hurley, Caltrans District Branch Chief, P/D Peninsula, re: Operational Analysis for Route 92/35 intersection modification in San Mateo County, April 15, 2002.

this location. The agency considered the concept again in 2016 and concluded a roundabout at this intersection warranted further study.[40]

The planning department commissioned a study of S.R. 92 crossing options which identified as potentially feasible a dual roundabout concept in which one roundabout is located at the S.R. 92/S.R. 35 intersection and another at the S.R. 92/Lifemark Road intersection.[41] The dual roundabout concept would accommodate the offset of the S.R. 35/S.R. 92 and Lifemark Road/S.R. 92 intersections, as they are separated by an approximately 300-foot length of S.R. 92. Under this concept, in the area between the roundabouts the lanes connecting the two roundabouts (i.e., lanes carrying east- and west-bound traffic) would come together giving the overall roundabout concept a dumbbell shape. This design would facilitate trail user crossing via at-grade striped crosswalk located at a narrow point between the two roundabouts, and signage would be installed to alert drivers to the presence of the crosswalk as they approach it. The study notes that the geometric design of the roundabouts would have traffic calming effects and, therefore, determined that crosswalk beacons or traffic signals would not be required for the crosswalk.[42]

Both the bridge and roundabout options would connect via new sidewalk to the existing adjacent Bay Area Ridge Trail segment along Lifemark Road to the north, and the southern skyline ridge trail trailhead and parking area approximately 300 feet to the south. The engineering feasibility and cost for a bridge crossing or roundabout have not been studied in detail.

Implementation of a grade-separated crossing of S.R. 92 with a landing on the east side of S.R. 35, as described above and identified as an option in Mitigation Measure M-TR-5b, Construction of a Pedestrian/Bicycle/ Equestrian Bridge or Roundabout, would substantially reduce the potential for hazardous conditions at this intersection by providing for a trail user crossing of S.R. 92 in a manner that would not conflict with existing vehicle traffic.

Similarly, implementation of the above-described roundabout concept at the S.R. 92/S.R. 35 and S.R. 92/Lifemark Road intersections, and identified as an option in Mitigation Measure M-TR-5b, also would provide passage for trail users across S.R. 92[43] and would reduce the potential hazardous conditions impacts at these intersections.

However, feasibility of both mitigation measures is unknown. Construction and operation of either measure would be contingent upon an agreement between the SFPUC and Caltrans because the measures would modify a state highway owned and maintained by Caltrans. It is currently uncertain if continued interagency coordination would result in an agreement that reduces the potentially hazardous condition. For these reasons, the impact would remain significant and unavoidable with mitigation under the proposed access program and variants 2 and 3.

40 Caltrans, *Transportation Concept Report State Route 92*, September 2016.
41 CHS Consulting Group, *State Route 92 and State Route 35 Ridge Trail Crossing Alternatives Technical Report*, July 2017.
42 Ibid.
43 Ibid.

Mitigation Measures M-TR-5a, M-TR-5b, and M-TR-5c apply to operation of the proposed access program and variants 2 and 3.

Mitigation Measure M-TR-5a – Installation of Signage.

The SFPUC shall install signs stating, "Do Not Cross" and "End of Fifield-Cahill Ridge Trail" or "End of Southern Skyline Ridge Trail" at the southern terminus of the existing Fifield-Cahill ridge trail and at the northern terminus of the proposed southern skyline ridge trail. The SFPUC shall also request that Caltrans install two-hour time limit signs in the vista point parking lot adjacent to the southern skyline ridge trailhead parking lot and "No Parking" signage along both sides of S.R. 35 at regular intervals from the S.R. 92/S.R. 35 intersection to the south approximately 500 feet.

Mitigation Measure M-TR-5b – Construction of a Pedestrian/Bicycle/Equestrian Bridge or Roundabout.

The SFPUC shall work with Caltrans to formulate and execute an agreement on the design, funding, and construction of either a grade-separated crossing or roundabout to reduce potentially hazardous conditions for trail user access across S.R. 92 near its intersections with S.R. 35 and Lifemark Road. The two options, as further described below based on preliminary evaluations conducted to-date, are conceptual, meaning that specific design elements may change.

- ***Bridge*** – The grade-separated crossing shall consist of an elevated pedestrian, bicycle, and equestrian bridge over S.R. 92 at the east leg of the intersection with S.R. 35. The bridge will connect to a high point on the north side of S.R. 92, use a spiral ramp on the south side of S.R. 92, and provide a full grade-separated connection that does not require any modifications to the S.R. 92/S.R. 35 intersection. The bridge piers will be constructed within the Caltrans right-of-way, outside of the travel lanes.

- ***Roundabout*** – The roundabout shall accommodate traffic flow among the S.R. 92 intersections with S.R. 35 and Lifemark Road (e.g., dual roundabout design). The SFPUC shall construct an at-grade crosswalk located at a safe point of pedestrian, cyclist, and equestrian passage at the roundabout (e.g., near the middle of the two roundabouts, where the distance between the opposing travel lanes is smallest). The roundabout shall be accompanied by signage installed adjacent to both the eastbound and westbound roadway approaches to the crosswalk to alert drivers of its presence. The crosswalk shall be marked with reflective, high-contrast pavement striping and pedestrian/cyclist/ equestrian trail crossing signs. The roundabout design shall be subject to Caltrans' review and approval, including for conformance with applicable state operations and safety design standards and best practices.

The agreement shall also provide for the construction of new sidewalks connecting the selected crossing improvement (i.e., bridge or roundabout) to the existing adjacent Bay Area Ridge Trail segment along Lifemark Road to the north, and the southern skyline ridge trail trailhead and parking area approximately 300 feet to the south. Considering that transportation safety has long been and will continue to be a challenge at the subject intersections independent of the project, SFPUC's financial contribution in the agreement shall be roughly proportional to the project's impact.

The selected crossing option (i.e., bridge or roundabout) shall be constructed prior to opening the Fifield-Cahill ridge trail to unsupervised public access (if southern skyline ridge trail is constructed) and prior to opening the southern skyline ridge trail to unsupervised public access.

Access Program Variant 1 (Docent Program)

Under variant 1, access to the two trail segments would be operated independently from one another. Visitors to the Fifield-Cahill ridge trail and/or southern skyline ridge trail would be under docent supervision, visitors would be required to park in designated lots, and crossing S.R. 92 would be prohibited. For these reasons, pedestrians, bicyclists, and equestrians would be unlikely to park in unauthorized areas or cross S.R. 92, and the potential for hazardous conditions under the docent program would not occur. The impact would, therefore, be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill and southern skyline ridge trails would result in significant impacts related to the increase of potential conflicts between vehicles and/or pedestrians, bicyclists, and equestrians. While implementation of Mitigation Measures M-TR-5a and M-TR-5b would reduce these impacts, the SFPUC does not know whether Caltrans would agree to implement the mitigation measures. Therefore, the impact would remain significant and unavoidable with mitigation.

Impacts of Mitigation Measures

CEQA Guidelines section 15126.4 states that "if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed, but in less detail than the significant effects of the project as proposed." This section identifies potential effects associated with the implementation of Mitigation Measure M-TR-5b, Construction of a Pedestrian/Bicycle/Equestrian Bridge or Roundabout. Either mitigation option (i.e., bridge or roundabout) would likely require various heavy equipment use, tree and brush removal, earthwork (e.g., grading and retaining walls), and drilling for bridge piers (bridge installation only).

Each of these construction activities could result in one or more secondary impacts related to: inadvertent disturbance to archaeological resources, human remains, and tribal cultural resources from ground-disturbing activities; substantial temporary increases in ambient noise from heavy equipment use near sensitive receptors; emissions from construction vehicles which could violate air quality standards and conflict with implementation of the 2017 clean air plan; and take of candidate, sensitive, or special-status plant and wildlife species through equipment movement and trees and brush removal. These impacts could be significant; however, implementation of mitigation measures described in Sections 4.3, Cultural Resources (M-CU-1); 4.5, Noise and Vibration (M-NO-1); 4.6, Air Quality (M-AQ-1a and -1b); 4.8, Biological Resources (M-BI-1a, -1b, -1c, -1d, M-BI-2a, -2c, -2d, and -2e); and 4.12, Tribal Cultural Resources (M-TCR-1) would reduce these impacts to less-than-significant levels.

Construction of the grade-separated crossing or a roundabout over/on S.R. 92 would also temporarily disrupt traffic flows on S.R. 92 and S.R. 35 resulting in potential secondary impacts to transportation and circulation. Operationally, the roundabouts would add a crosswalk that may also result in potential secondary impacts to transportation and circulation. Should Caltrans agree to undertake a pedestrian bridge crossing or roundabout project at this location, such project would be subject to a separate CEQA process that would fully analyze and disclose the environmental impacts of the measures. CEQA does not require this project to speculate regarding the impacts of potential future roadway improvements that would be under the jurisdiction of Caltrans and beyond SFPUC's control. In addition, there is insufficient information on the mitigation measures' design, schedule, and funding to analyze these measures further.

Cumulative Impacts

Impact C-TR-1: The project, in combination with past, present, and probable future projects, would not substantially affect transportation and circulation. (Less than Significant)

The geographic scope for potential cumulative impacts related to transportation and circulation encompasses roadways in the project area (S.R. 35 between S.R. 92 and the Phleger Estate, S.R. 92 between I-280 and S.R. 1, and I-280 in the vicinity of the I-280/S.R. 92 interchange). As discussed above for project-specific impacts, transportation and circulation considerations include the effect of project construction and operation on roadway operating conditions (i.e., performance), emergency access, and potentially hazardous conditions for vehicles, pedestrians, bicyclists, and equestrians.

As described above under Impact TR-1, project construction would result in a temporary (approximately 12-month) increase in vehicle trips on S.R. 35, S.R. 92, and I-280. In addition, as described above under Impact TR-4, project operations would result in a permanent increase in vehicle trips on these roadways. Of the cumulative projects listed in Table 4.1-1 in Section 4.1, Overview, only those that would be accessed via those roads and have overlapping construction schedules could contribute to cumulative transportation impacts. No residential or commercial projects are currently being developed in the immediate project vicinity that would increase operational traffic.

The Pacific Gas and Electric Company Gas Transmission Line 109 project is sufficiently distant from the project area, major construction activities were completed in December 2018, and all related work is estimated to be completed before construction of the project would begin. The Lower Crystal Springs Dam Bridge Replacement project is sited in the project area but has been completed. The S.R. 92 Bike Lanes project, S.R. 92 Passing Lane/Climbing Lane project, and S.R. 92/S.R. 35 roundabout project are all sited in or adjacent to the project area, but each has an unknown construction schedule. None of the projects described above are expected to have schedules that would overlap with the project. Thus, none would be expected to have impacts that could combine with those of the project's construction to substantially affect transportation and circulation on project area roadways. Furthermore, they are not expected to generate

substantial operational traffic or reduce the capacity of roadways near the project. This is because these types of projects (i.e., infrastructure) typically generate very few, if any, vehicle trips for periodic maintenance activities and are contiguous with other recreational facilities that are already regularly used by regional recreationists. Therefore, the cumulative effect of the project combined with cumulative projects on transportation and circulation would not be significant.

Mitigation: None required.

4.5 Noise and Vibration

This section describes the existing noise environment in the project area and identifies the potential for noise and vibration impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project under the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). The impact analysis evaluates the project's potential to generate excessive noise or vibration and examines the potential for such effects on people and structures. During public scoping, the San Francisco Planning Department did not receive comments on the topic of noise.

4.5.1 Environmental Setting

This section establishes the environmental context for the noise and vibration impacts analysis. The environmental setting for the project lies entirely within the geographic extent of the noise setting characterized in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR).[1] The following subsections present an overview of noise (i.e., sound pressure) and its relationship to the physical environment; discuss how noise is measured and its health effects on humans; and describe the ambient noise environment in the vicinity of the project (including sources of ambient noise) as well as vibration- and *noise-sensitive receptors*.[2]

4.5.1.1 Noise Background

Sound is characterized by various parameters that describe the rate of *oscillation* (frequency) of sound waves, the distance between successive troughs or crests in the wave, the speed that the wave travels, and the pressure level or energy content of a given sound. The sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound, and the decibel scale is used to quantify sound intensity. Because sound can vary in intensity by over 1 million times within the range of human hearing, a logarithmic loudness scale is used to keep sound intensity numbers at a convenient and manageable level. Since the human ear is not equally sensitive to all sound frequencies within the entire spectrum, human response factors into sound descriptions in a process called "A-weighting," expressed as "dBA." The dBA, or *A-weighted decibel*, refers to a scale of noise measurement that approximates the range of sensitivity of the human ear to sounds of different frequencies. On this scale, the normal range of human hearing extends from about 0 dBA to about 140 dBA. An increase of 10 dBA in the level of a continuous noise represents a perceived doubling of loudness. The noise levels presented

1 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.L Noise (p. III.L-1). Planning Department Case No. 96.222E, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

2 Noise sensitive receptors are generally considered to include hospitals, nursing homes, senior citizen centers, schools, churches, libraries, and residences.

herein are expressed in terms of dBA, unless otherwise indicated. Table 4.5-1 shows some representative noise sources and their corresponding noise levels in dBA.[3]

TABLE 4.5-1
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT

Examples of Common, Easily Recognized Sounds	Decibels (dBA) at 50 feet	Subjective Evaluations
Near Jet Engine	140	Deafening
Threshold of Pain (Discomfort)	130	
Threshold of Feeling – Hard Rock Band	120	
Accelerating Motorcycle (at a few feet away)	110	
Loud Horn (at 10 feet away)	100	Very Loud
Noisy Urban Street	90	
Noisy Factory	85	
School Cafeteria with Untreated Surfaces	80	Loud
Near Freeway Auto Traffic	60	Moderate
Average Office	50	
Soft Radio Music in Apartment	40	Faint
Average Residence Without Stereo Playing	30	
Average Whisper	20	Very Faint
Rustle of Leaves in Wind	10	
Human Breathing	5	
Threshold of Audibility	0	

NOTE: Continuous exposure above 85 dBA is likely to degrade the hearing of most people. Range of speech is 50 to 70 dBA.

SOURCE: U.S. Department of Housing and Urban Development, 1985.

Planning for acceptable noise exposure must consider the types of activities and corresponding noise sensitivity in a specified location for a generalized land use type. Some general guidelines are as follows: sleep disturbance can occur at levels above 35 dBA; interference with human speech begins at about 60 dBA; and hearing damage can result from prolonged exposure to noise levels in excess of 85 to 90 dBA.[4]

[3] U.S. Department of Housing and Urban Development, *The Noise Guidebook*, 1985, *http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/environment/training/guidebooks/noise*; divided into chapters with Chapter 1 at *http://portal.hud.gov/hudportal/documents/huddoc?id=DOC_16414.pdf*, accessed October 14, 2014.

[4] U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*, March 1974. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

Attenuation of Noise

Line sources of noise, such as roadway traffic, *attenuate* (lessen) at a rate of 3 to 4.5 dBA per doubling of distance from the source, based on the *inverse square law*[5] and the equation for *cylindrical spreading*[6] of noise waves over hard and soft surfaces.

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate at a rate of 6 to 7.5 dBA per doubling of distance from the source, based on the inverse square law and the equations for *spherical spreading*[7] of noise waves over hard and soft surfaces.[8] This analysis assumes that noise from line and point sources to a distance of 200 feet attenuates at rates of between 3 and 6 dBA per doubling of distance, and the noise from line and point sources at a distance greater than 200 feet attenuates at a rate of 4.5 to 7.5 dBA per doubling of distance, to account for the absorption of noise waves due to ground surfaces such as soft dirt, grass, bushes, and intervening structures.[9]

Noise Descriptors

Time variations in noise exposure are typically expressed in terms of a *steady-state energy level* (L_{eq}) that represents the acoustical energy of a given measurement. L_{eq} is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level that would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period). The L_{90} is also a noise metric that can be used to describe existing ambient noise levels. Because noise receptors are more sensitive to unwanted noise intrusion during the evening and at night, California state law[10] requires that, for planning purposes, an artificial dBA increment be added to "quiet time" noise levels to form a 24-hour noise descriptor called the *day-night noise level* (L_{dn}). Ldn adds a 10-dBA penalty during the night hours (10 p.m. to 7 a.m.). The *maximum noise level* (L_{max}) is the maximum instantaneous noise level measured during the measurement period of interest.

Health Effects of Environmental Noise

The World Health Organization is perhaps the best source of current knowledge regarding the health effects of noise impacts because European nations have continued to study noise and its health effects, while the U.S. Environmental Protection Agency all but eliminated its noise investigation and control program in the 1970s. According to the World Health Organization,

5 The movement of the vehicles makes the source of the sound appear to emanate from a line (line source) rather than a point when viewed over a time interval. This results in cylindrical spreading rather than spherical spreading. Because the change in surface area of a cylinder only increases by two times for each doubling of the radius instead of the four times associated with spheres, the change in sound level is 3 dBA per doubling of distance.

6 The inverse square law is associated with spherical spreading associated with a point source where the change in sound level is 3 dBA per doubling of distance.

7 Spherical spreading describes the decrease in sound level when a sound wave propagates away from a source uniformly in all directions.

8 California Department of Transportation (Caltrans), *Technical Noise Supplement*, September 2013, *http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf*, accessed April 3, 2017.

9 Ibid.

10 State of California Government Code section 65302.

sleep disturbance can occur when continuous indoor noise levels exceed 30 dBA or when intermittent interior noise levels reach 45 dBA, particularly if background noise is low. With a bedroom window slightly open (a reduction from outside to inside of 15 dB), the World Health Organization criteria suggest that continuous exterior (ambient) nighttime noise levels should be 45 dBA or below, and short-term noise events should not generate noise levels in excess of 60 dBA to avoid disturbing sleep. The World Health Organization also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective with respect to people's ability to initially fall asleep.[11]

The World Health Organization also identifies other potential health effects of noise, including decreased performance on complex cognitive tasks such as reading, attention span, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, although shorter-term exposure to very high noise levels—for example, exposure several times a year to concert noise at 100 dBA—can also damage hearing). In addition, noise can cause annoyance and trigger emotional reactions such as anger, depression, and anxiety. The World Health Organization reports that, during daytime hours, few people are seriously annoyed by noise levels below 55 dBA or moderately annoyed by noise levels below 50 dBA.

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to ambient noise levels. Short-term noise sources—such as truck backup beepers, the crashing of material being loaded or unloaded, car doors slamming, and engines revving outside a nightclub—contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and severe annoyance. The importance of noise to receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels, if they occur at night, can disturb sleep.

4.5.1.2 Existing Noise Environment

Long-term environmental noise in open space or less developed areas primarily depends on the distance to and the volume of traffic on major roadways. Aircraft overflights can also be a primary contributor to existing noise levels in open space areas. As described in the management plan EIR, the Peninsula Watershed is mostly undeveloped and quiet in a manner typical of rural or suburban environments. The existing ambient noise environment within the project area is dominated by vehicle traffic on State Route 92 (S.R. 92) and State Route 35 (S.R. 35).[12] As also noted in the management plan EIR, other minor noise sources within and adjacent to the project area include SFPUC operations and maintenance activities, Filoli Estate maintenance activities, residential land uses, and operations at the Skylawn Memorial Park.[13]

11 World Health Organization, *Guidelines for Community Noise, Geneva*, 1999, *http://apps.who.int/iris/handle/10665/66217*, accessed April 3, 2017.
12 S.R. 35 is also Skyline Boulevard in this location.
13 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.L, Noise (p. III.L-1).

Ambient Noise Measurements

The SFPUC conducted an ambient-noise survey on September 15, 2016 and April 25, 2017 to document the existing noise conditions at various locations in the project area.[14] Short-term (15-minute) noise level measurements were taken in accordance with the American National Standards Institute's acoustic standards at five locations.

Figure 4.5-1 shows the noise measurement locations. To characterize ambient noise in the project area, the SFPUC collected short-term measurement data at locations where noise-sensitive receptors (primarily residential land uses) exist near the proposed trail alignment, as described in Table 4.5-2.

TABLE 4.5-2
SHORT-TERM AMBIENT NOISE LEVEL DATA IN THE PROJECT AREA

Measurement Location	Time	Noise Levels in dBA		
		Hourly L_{eq}	L_{90}	L_{max}
1. ***11200 Skyline Boulevard***. Residence approximately 180 feet west of the southern skyline ridge trail alignment.	3:20 – 3:35 p.m.	51.2	40	70.8
2. ***12150 Skyline Boulevard***. Residence approximately 120 feet west of the southern skyline ridge trail alignment.	3:42 – 3:57 p.m.	65.3	41	82.9
3. ***12475 Skyline Boulevard***. Residence approximately 600 feet south of access drive and 400 feet west of the southern skyline ridge trail alignment.	4:02 – 4:17 p.m.	60.2	37	74.6
4. ***S.R. 35 at Harkins Road***. Residence approximately 500 feet west of the southern skyline ridge trail alignment.	4:28 – 4:43 p.m.	61.9	36	79.3
5. ***Skylawn Memorial Park***. Northeastern plots on ridge approximately 1,500 feet from parking lot for the Fifield-Cahill ridge trail.	5:23 – 5:43 p.m.	46.1	40	62.7

NOTES: See Figure 4.5-1 for noise measurement locations.
L_{eq} represents the constant sound level; L_{max} is the maximum noise level. L_{90} is the background noise level. Time of day of short-term monitoring reflect daytime hours during which construction activities could occur.

SOURCE: AECOM, 2016.

4.5.1.3 Vibration Background

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. The *peak particle velocity* is defined as the maximum instantaneous peak of the vibration signal. The peak particle velocity is most frequently used to describe physical vibration impacts on buildings. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include people (especially residents, the elderly, and sick people), structures (especially older masonry structures), and vibration-sensitive equipment.

14 AECOM, *Draft Noise Analysis for the Southern Skyline Boulevard Ridge Trail Extension*, November 18, 2016.

SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.5-1

Noise Measurement Locations

Another useful vibration descriptor is known as *vibration decibels*, which are generally used when evaluating human response to vibration as opposed to structural damage (for which peak particle velocity is the more commonly used descriptor). Vibration decibels are established relative to a reference quantity, typically 1×10^{-6} inches per second.[15]

There are no meaningful sources of man-made vibration in the project area. Most motor vehicles and trucks that travel along S.R. 35 and S.R. 92 and could cause groundborne vibration in the project area have independent suspension systems that substantially reduce if not eliminate vibration generation, except when there are potholes, expansion joints, or other discontinuities in the roadway surface.

4.5.1.4 Sensitive Receptors

Sensitive receptors for noise are generally considered to include hospitals, nursing homes, senior citizen centers, schools, churches, libraries, and residences. Section 4.88 of the San Mateo County Code establishes exterior noise standards that apply to single or multiple family residences, schools, hospitals, churches, and public libraries situated in either incorporated or unincorporated areas of the county. As noted in the management plan EIR, there are few noise-sensitive receptors located within the Peninsula Watershed. The exceptions include a few scattered residences (e.g., SFPUC watershed-keeper cottages and a few homes along S.R. 35).[16] The sensitive receptors nearest to the project area are residential uses identified in Table 4.5-2, above.

While the Skylawn Memorial Park is approximately 750 feet from the northernmost extent of the proposed southern skyline ridge trail parking lot and 1,500 feet from the southernmost extent of the proposed Fifield-Cahill ridge trail parking lot and restroom, cemeteries are not specifically identified as a noise-sensitive land use in the San Mateo County General Plan. The general plan does contain a definition of "quiet area," defined as areas with perceived low ambient noise levels, which may be interpreted to include cemeteries. Table 16-7 of the general plan identifies noise environments of up to 75 L_{dn} as normally acceptable for cemeteries.

4.5.2 Regulatory Framework

4.5.2.1 Federal Regulations

Federal regulations establish noise limits for medium and heavy trucks (more than 4.5 tons, gross vehicle weight rating) under title 40 of the Code of Federal Regulations, part 205, subpart B. The federal truck passby noise standard is 80 dBA at 50 feet from the vehicle pathway centerline, under specified test procedures. These standards are implemented through regulatory controls on truck manufacturers.

The federal Noise Control Act of 1972 established a national policy "to promote an environment for all Americans free from noise that jeopardizes their public health and welfare." The act provides

15 Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, 2006.
16 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.F, Noise (p. III.F-6).

for a division of powers between the federal government and state and local governments that affords primary responsibility for noise source emission control to the federal government. State and local governments retain rights, authorities, and primary responsibility for controlling the use of noise sources and the levels of noise to be permitted within their jurisdictions.[17] The San Mateo County Planning Department, Code Enforcement Division, is the applicable regulatory agency for noise within the project area.

4.5.2.2 State Regulations

The California Vehicle Code, section 27204, sets limits for the noise generated by on-road trucks manufactured since 1987. Noise levels must not exceed 80 dBA when measured at 50 feet from the line of travel for any operating condition.

The California Occupational Safety and Health Administration requires backup warning alarms for all vehicles that are used to haul dirt and have a haulage capacity of 2.5 cubic yards or more (title 8, California Code of Regulations). Backup alarms must activate immediately upon reverse movement and must be audible above the surrounding ambient noise level at a distance of 200 feet.

4.5.2.3 Local Regulations

San Mateo County

As described in the management plan EIR, the San Mateo County Noise Ordinance (chapter 4.88) specifies exterior noise standards for uses adjacent to residences, schools, hospitals, churches, or public libraries.[18] The ordinance specifies standards for maximum allowable exterior and interior noise levels. The ordinance exempts construction noise from its noise standards, provided that activities involving noise sources associated with demolition, construction, repair, remodeling, or grading of any real property do not take place between 6 p.m. and 7 a.m. on weekdays, between 5 p.m. and 9 a.m. on Saturdays, or at any time on Sundays, Thanksgiving, and Christmas.[19]

For operational noise sources within the unincorporated area of the county, including the project area, the ordinance establishes exterior noise standards at any school, hospital, church, public library, or single- or multiple-family residence situated in either the incorporated or unincorporated area. Table 4.5-3 presents these exterior noise standards.

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17 U.S. Environmental Protection Agency, *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety* (Condensed Version), EPA/ONAC 550/9-74-004, Washington D.C., March 1974.

18 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.L, Noise (p. III.L-1).

19 San Mateo County, *San Mateo County Noise Ordinance*, chapter 4.88, Noise Control,1982, *https://www.municode.com/library/ca/san_mateo_county/codes/code_of_ordinances?nodeId=TIT4SAHE_CH4.88NOCO_4.88.300LEOF*, accessed April 24, 2017.

TABLE 4.5-3
EXTERIOR NOISE STANDARDS AT RECEIVING LAND USES:
RESIDENTIAL, SCHOOL, HOSPITAL, CHURCH, OR PUBLIC LIBRARY PROPERTIES

Cumulative Number of Minutes (in any 1-hour time period)	Noise Level Standards, dBA	
	Daytime 7 a.m. to 10 p.m.	Nighttime 10 p.m. to 7 a.m.
30	55	50
15	60	55
5	65	60
1	70	65
0	75	70

NOTES:
- In the event the measured background noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted in 5 dBA increments so as to encompass the background noise level.
- Each of the noise level standards specified above shall be reduced by 5 dBA for simple tone noises, consisting primarily of speech or music, or for recurring or intermittent impulsive noises.
- If the intruding noise source is continuous and cannot reasonably be stopped for a period of time whereby the background noise level can be measured, the noise level measured while the source is in operation shall be compared directly to the noise level standards in Table 4.5-3.

SOURCE: San Mateo County, 1982.

4.5.3 Impacts and Mitigation Measures

4.5.3.1 Significance Criteria

For this EIR analysis, the project would have a significant noise and vibration impact if it would:

- Expose people to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Expose people to or generate excessive groundborne vibration or groundborne noise levels;
- Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- Result in a substantial temporary or periodic increase in ambient noise levels near the project above levels existing without the project;
- For a project located within an airport land use plan area, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels; or
- For a project located near a private airstrip, expose people residing or working in the project area to excessive noise levels.

Due to the location and nature of the project, there would be no impacts related to the following significance criteria for the reasons described below; therefore, these criteria are not discussed further.

- ***Result in excessive groundborne vibration or groundborne noise levels during project operations.*** With project implementation, routine maintenance and operations of the proposed facilities (e.g., restroom cleaning, vegetation management, minor facilities repairs) would not include activities that generate excessive groundborne vibration or groundborne noise levels. Thus, the criterion related to groundborne vibration and groundborne noise levels is not applicable to project operations and is discussed below under the impact analysis only as it relates to project construction (see Impact NO-3).
- ***Be located within 2 miles of a public airport or within an airport land use plan area and expose people to excessive noise levels.*** There are no public airports near the project area, which is not located in an area covered by an airport land use plan. The public airports nearest the project area are the San Carlos Airport, which is approximately 7 miles to the southeast, and the Half Moon Bay Airport, which is approximately 7 miles to the northwest. Therefore, the project would not result in the long-term exposure of workers or visitors to excessive airport-related noise levels. The significance criterion related to noise levels within an airport land use plan area is not applicable to the project, and no further discussion is provided.
- ***Be located near a private airstrip and expose people to excessive noise levels.*** There are no private airstrips in the project vicinity. The nearest private airstrip is the Mills Peninsula Emergency Medical Facility Heliport in Burlingame, approximately 7 miles to the northeast. Therefore, the project would not result in the long-term exposure of workers or visitors to excessive airport-related noise levels. The significance criterion related to noise levels near private airstrips is not applicable to the project, and no further discussion is provided.

4.5.3.2 Approach to Analysis

Project Impacts

The noise impact assessment evaluates short-term (temporary) impacts associated with the construction of project facilities, as well as long-term (permanent) impacts resulting from project operations. For construction noise, the this EIR evaluates the potential for impacts by considering several factors, including the proximity of construction-related noise sources to sensitive receptors, typical noise levels associated with different types of construction equipment, the potential for construction noise levels to interfere with daytime and nighttime activities, the duration that sensitive receptors would be affected, and whether proposed activities would occur outside of the construction time limits prescribed in local ordinances. For operational noise, the impact evaluation determines the noise generation potential of project facilities and operations. If the project would introduce a new source of noise into the area, this EIR assesses the potential for impacts by considering the proximity to sensitive receptors and whether the operational noise would remain within the local noise level standards applicable at the nearest receptors.

To address the CEQA significance criterion regarding "substantial temporary or periodic noise increases in ambient noise levels" for construction noise, the San Francisco Planning Department considers an increase of 10 dBA over existing noise levels from persistent construction to be a substantial temporary increase in noise levels for residential land uses. Such an increase correlates

to a perceived doubling of loudness[20] and is derived from section 2909 of the San Francisco Police Code and is applied herein in lieu of any designated San Mateo County-specific threshold. For the Skylawn Memorial Park, this analysis applies San Francisco's land use compatibility standard of 75 L_{dn} that, for daytime hours, correlates to an hourly daytime L_{eq} of 75 dBA.

To address the CEQA significance criterion regarding "noise levels in excess of standards established in the local general plan or noise ordinance," this EIR applies the construction time limits (for construction impacts) and exterior noise level standards (for operational impacts) of the San Mateo County Noise Ordinance as the threshold for a "substantial" noise increase. In accordance with the San Mateo County Noise Ordinance, the applicable noise level standard requires adjustment when the existing ambient noise levels exceed the noise level standards presented in Table 4.5-3. For construction impacts, this analysis considers whether construction would occur within the construction time limits, which are 7 a.m. to 6 p.m. on weekdays, and 9 a.m. to 5 p.m. on Saturdays and Sundays. For operational impacts, this analysis considers whether exterior noise levels at nearby sensitive land uses would be consistent with the standards established in the County noise ordinance and presented in Table 4.5-3 during project operations.

To assess potential construction-related vibration impacts on engineered (i.e., modern) aboveground buildings and structures during construction, this analysis applies the following thresholds:[21]

- **0.012 inch/second peak particle velocity.** Human disturbance or annoyance could occur during nighttime construction if vibration exceeds this level.
- **0.2 inch/second peak particle velocity.** Cosmetic damage to non-engineered buildings or aboveground structures (i.e., fragile or historic buildings) could occur if vibration exceeds this level.
- **0.4 inch/second peak particle velocity.** Cosmetic damage to engineered buildings or aboveground structures could occur from continuous vibration (i.e., vibration associated with vibratory equipment such as vibratory compactors and vibratory pile drivers) if vibration exceeds this level.
- **0.5 inch/second peak particle velocity.** Cosmetic damage to engineered buildings or aboveground structures could occur from for transient vibration (i.e., vibration associated with impact pile driving) if vibration exceeds this level.

This analysis does not use the above significance thresholds of 0.012 inch/second peak particle velocity and 0.2 inch/second peak particle velocity because there are no non-engineered (fragile) buildings or structures near the project and no nighttime construction is proposed. The assessment of vibration impacts focuses on whether construction would result in excessive groundborne vibration that could damage nearby aboveground structures.

[20] Caltrans, *Technical Noise Supplement*, September 2013, *http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf*, accessed April 3, 2017.
[21] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, 2006, pp. 12-13.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. The cumulative analysis for noise and vibration impacts 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.

The cumulative analysis considers whether there would be a significant adverse cumulative impact associated with the effects of project implementation in combination with those of proximate 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 effects are considered significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.5.3.3 Impact Summary

Table 4.5-4 summarizes the impacts of the project related to noise and vibration. The impact summary table provides separate significance determinations for the proposed access program and variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access).

TABLE 4.5-4
SUMMARY OF IMPACTS – NOISE AND VIBRATION

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact NO-1: Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	LSM	LSM	LSM	LSM
Impact NO-2: Construction activities would not result in excessive groundborne vibration.	LS	LS	LS	LS
Impact NO-3: Project operations would not result in a substantial permanent increase in ambient noise levels at the closest receptors or expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	LS	LS	LS	LS
Impact C-NO-1: Construction of the project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels near the project area.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.5.3.4 Impact Analysis

Construction Impacts

Impact NO-1: Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance. (Less than Significant with Mitigation)

The management plan EIR considers the potential for construction activities associated with the project to substantially increase noise levels at the location of any noise-sensitive receptor over an extended period of time. The management plan EIR acknowledges potential noise increases associated with construction traffic and work, but generally concludes these activities would not substantially increase noise levels at sensitive receptors due to the location of project component sites and noise sources within the watershed boundary that would be generally distant from sensitive receptors. For these reasons, the management plan EIR concludes these effects would be less than significant.[22] The following discussion evaluates potential construction noise impacts in light of the site-specific and project-level information that the SFPUC has developed since management plan EIR certification (see Chapter 2, Project Description).

Project-related construction activities would result in temporary noise increases at sensitive receptors located near the project area. Construction noise levels would vary at any given receptor depending on the construction activity, equipment type, duration of use, distance between the noise source and receptor, and the presence or absence of barriers between the noise source and receptor.

All construction would be conducted on weekdays between 7 a.m. and 6 p.m. and on Saturdays between 9 a.m. and 5 p.m. The SFPUC does not propose any construction during nighttime or legal holidays.

For daytime construction noise, a substantial noise increase is defined as a temporary increase of up to 10 dBA over ambient levels at residential land uses; this is a perceived doubling of loudness. Impacts at the Skylawn Memorial Park are assessed relative to a 75 dBA land use compatibility standard. The EIR's noise analyst conducted modeling of potential noise levels from project construction using the roadway Noise Construction Model of the Federal Highway Administration. The model estimates noise levels from simultaneous operation of multiple types of construction equipment. As indicated in Chapter 2, Project Description (Table 2-1), there are a number of different equipment types that would be required for construction. However, not all of these equipment types would be operating at a given time. To perform a refined analysis, the EIR's noise analyst conducted an assessment for these specific project elements:

- Trail construction
- Parking lot construction
- Installation of fencing
- Permanent driveway construction
- Restroom construction
- Bridge installation

[22] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.L, Noise (p. III.L-1); Section V.L, Noise (p. V-43).

The analyst predicted noise levels at the nearest sensitive receptors for each of these project elements. Under the proposed access program and variant 1, the SFPUC would not construct new barbed-wire fencing along the Fifield-Cahill ridge trail between Cemetery Gate and Portola Gate. Under access program variants 2 and 3, the SFPUC would construct fencing between these locations. Under the proposed access program and variants, the SFPUC would construct new and improve existing fencing along the southern skyline ridge trail. It is conservatively assumed that the SFPUC would use portable augers to install fence posts. The proposed access program and variants would all include the same project components that would result in the highest levels of construction noise near sensitive receptors (e.g., trail, parking lot, access drives, and restroom). Consequently, potential noise impacts from construction activity are the same for the proposed access program and variants.

Trail Construction

Trail construction activities would occur as close as 120 feet from the nearest receptor (12150 Skyline Boulevard). To estimate the noise from trail construction, the simultaneous operation of the following equipment types (listed in Table 2-1 in Chapter 2, Project Description) are assumed to be typical for trail construction clearing, grubbing, grading, excavation, and compaction activities: excavator, bulldozer, compactor, an auger for fence installation, and dump truck. Additionally, crane operations are assumed to occur within 180 feet of the receptor at 11200 Skyline Boulevard, where the SFPUC would install the bridge. Table 4.5-5 presents the predicted noise levels for trail construction, as calculated using the Roadway Construction Noise Model. As shown in the table, temporary construction noise could increase ambient noise levels at the nearest residences along the northernmost portion of the trail by more than 10 dBA, which would constitute a significant impact.

TABLE 4.5-5
PREDICTED NOISE LEVELS AT SENSITIVE RECEPTORS FROM TRAIL CONSTRUCTION ACTIVITIES

Receptor Location	Noise Levels in dBA		
	Existing Hourly L_{eq}	Predicted L_{eq} with Construction	Increase in Noise Level
1. ***11200 Skyline Boulevard.*** Residence approximately 180 feet west of the southern skyline ridge trail alignment	51.2	**72.6**	**21.4**
2. ***12150 Skyline Boulevard***. Residence approximately 120 feet west of the southern skyline ridge trail alignment	65.3	**75.8**	**10.5**
3. ***12475 Skyline Boulevard***. Residence approximately 600 feet south of access drive and 400 feet west of the southern skyline ridge trail alignment	60.2	65.4	5.2
4. ***Skyline Boulevard at Harkins Road***. Residence approximately 500 feet west of the southern skyline ridge trail alignment	61.9	63.4	1.5
5. ***Skylawn Memorial Park***. Cemetery land use approximately 1,500 feet north the southern skyline ridge trail alignment	46.1	53.9	7.8[a]

NOTES: **Bolded** values reflect noise increases of 10 dBA or greater.

[a] Impacts at the memorial park are assessed relative to a 75 dBA land use compatibility standard.

SOURCE: Roadway Construction Noise Model, 2017.

Construction for the proposed universal access loop trail would occur more than 4,000 feet to the north from the northernmost plots of Skylawn Memorial Park. At this distance, construction noise would be attenuated to background levels before reaching these plots, particularly when factoring the intervening changes in vegetation and topography. Therefore, noise impacts from construction of the loop trail would be less than significant.

Parking Lot Construction

Parking lot construction activities would take place more than 4,000 feet from the nearest residence, which is distant enough that construction noise would be attenuated to background levels before reaching the residence, particularly when factoring the intervening vegetation and changes in topography. However, construction of the 20-vehicle lot proposed for the southern skyline ridge trail would be approximately 750 feet from the nearest plot within Skylawn Memorial Park. Construction of the 50-vehicle parking lot along the Fifield-Cahill ridge trail would be approximately 1,500 feet north of the nearest plot within Skylawn Memorial Park.

To estimate the noise from parking lot construction, the simultaneous operation of the following equipment types from Table 2-1 are assumed as typical for parking lot construction clearing, grubbing, grading, compaction, and paving activities: scraper, bulldozer, compactor, paver, loader, and dump truck. Predicted noise levels for project parking lot construction as calculated using the Roadway Construction Noise Model are presented in Table 4.5-6. As noted, temporary noise from construction of the parking lot near the southern skyline ridge trail would not increase ambient noise levels above the 75 dBA threshold derived from the land use compatibility standard for cemeteries, which would be a less than significant impact.

TABLE 4.5-6
PREDICTED NOISE LEVELS AT SENSITIVE RECEPTORS FROM PARKING LOT CONSTRUCTION ACTIVITIES

Receptor Location	Noise Levels in dBA		
	Existing Hourly L_{eq}	Predicted L_{eq} with Construction	Exceed 75 dBA?
5. ***Skylawn Memorial Park***, approximately 750 feet north of the southern skyline ridge trail parking lot.	46.1	60.8	No
5. ***Skylawn Memorial Park***, approximately 1,500 feet southeast of Fifield-Cahill ridge trail parking lot.	46.1	54.7	No

SOURCE: Roadway Construction Noise Model, 2017.

Permanent Access Drive Construction

Construction activities for five new permanent access drives and improvements to four existing access drives would occur as close as 100 feet from the nearest sensitive receptor (12150 Skyline Boulevard). To estimate the noise from access drive construction, the simultaneous operation of the following equipment types from Table 2-1 were assumed as typical and noisiest for roadway construction, grading, and compaction activities: compactor, paver, loader and dump truck. Predicted noise levels for access drive construction, as calculated using the Roadway Construction Noise Model, are presented in Table 4.5-7. This table shows that temporary noise

from construction of the access drive would increase ambient noise levels at the nearest (and only) receptor by less than 10 dBA, which would constitute a less-than-significant impact. Noise levels at other receptors would be lower because of their increased distance from the noise source, and therefore would also be a less-than-significant impact.

TABLE 4.5-7
PREDICTED NOISE LEVELS AT SENSITIVE RECEPTORS FROM DRIVEWAY CONSTRUCTION ACTIVITIES

Receptor Location	Noise Levels in dBA		
	Existing Hourly L_{eq}	Predicted L_{eq} with Construction	Increase in Noise Level
2. ***12150 Skyline Boulevard.*** Residence approximately 100 feet west of access drive for the southern skyline ridge trail alignment.	65.3	74.7	9.4

SOURCE: Roadway Construction Noise Model, 2017.

Restroom Construction

Construction activities for the southernmost restroom along the southern skyline ridge trail alignment would occur approximately 200 feet from the nearest receptor. The distance and intervening topography between the project site and sensitive receptor would attenuate construction noise, but the temporary increase in daytime noise would still be measurable. The northernmost restroom of the southern skyline ridge trail alignment would be over 900 feet from the nearest receptor. At this distance, construction noise would be attenuated to background levels before reaching the sensitive receptor. To estimate the noise from restroom construction at the nearest sensitive receptor (12986 Skyline Boulevard), the simultaneous operation of the following equipment types from Table 2-1 were assumed as typical and noisiest for excavation of pit toilets and construction of the enclosure: excavator, loader, and dump truck. Predicted noise levels for restroom construction, as calculated using the Roadway Construction Noise Model, are presented in Table 4.5-8. As that table shows, temporary construction noise could increase ambient noise levels at the nearest receptor by more than 10 dBA, which would constitute a significant impact.

TABLE 4.5-8
PREDICTED NOISE LEVELS AT SENSITIVE RECEPTORS FROM RESTROOM CONSTRUCTION ACTIVITIES

Receptor Location	Noise Levels in dBA		
	Existing Hourly L_{eq}	Predicted L_{eq} with Construction	Increase in Noise Level
7. ***12986 Skyline Boulevard.*** Residence approximately 200 feet west of the southern skyline ridge trail southern restroom.	51.2	**62.8**	**11.6**

NOTES: **Bolded** values reflect noise increases of 10 dBA or greater

SOURCE: Roadway Construction Noise Model, 2017.

Construction of the proposed restroom along the Fifield-Cahill ridge trail would take place more than 1,500 feet north of the nearest plot within Skylawn Memorial Park. At this distance, construction noise would be attenuated to background levels before reaching the sensitive receptor, particularly when factoring in the vegetation and changes in topography between the construction and receptor. Therefore, noise impacts from construction of the restroom would be less than significant.

Impact Summary

Construction activities could cause temporary increases in noise levels at the closest sensitive receptors during periods of trail construction along the northernmost portion of the southern skyline ridge trail alignment and during construction of the southernmost restroom along the southern skyline ridge trail, which would be a significant impact. Implementation of Mitigation Measure M-NO-1, Construction Noise Reduction**,** during project construction would reduce this impact to a less-than-significant level by requiring the SFPUC and its contractors to adhere to construction noticing requirements, limitations on hours of construction, and technical and operational methods for reducing noise impacts.

Mitigation Measure M-NO-1 applies to construction of the northernmost portion of the southern skyline ridge trail and southernmost restroom along the southern skyline ridge trail.

Mitigation Measure M-NO-1 – Construction Noise Reduction.

The SFPUC shall incorporate the following practices into the construction contract agreement documents, which the construction contractor shall implement:

- Post signs onsite pertaining to permitted construction days and hours and complaint procedures and who to notify in the event of a problem, with telephone numbers listed;
- At least two weeks prior to commencement of construction, provide notice of impending construction and construction schedule to sensitive receptors located within 500 feet of the northernmost 2 miles of the proposed southern skyline ridge trail, parking lot, and restroom construction, and the site of the Fifield-Cahill ridge trail parking lot;
- Limit construction activity to the exempted hours (7 a.m. to 6 p.m. on weekdays; 9 a.m. to 5 p.m. on weekends) of the San Mateo County Code chapter 4.88;
- To the extent that it does not extend the overall schedule, select "quiet" construction methods and equipment (e.g., improved mufflers, use of intake silencers, engine enclosures);
- Locate stationary equipment, material stockpiles, and vehicle staging areas as far as practicable from sensitive receptors;
- Avoid placing stationary noise-generating equipment (e.g., generators, compressors) within noise-sensitive buffer areas (measured at 200 feet) from immediately adjacent neighbors;
- Ensure all construction equipment is in good working order and mufflers are inspected for proper functionality;

- Prohibit unnecessary idling of equipment and engines;
- To the extent that it does not extend the overall schedule, limit the simultaneous operation of multiple pieces of construction equipment close to noise-sensitive land uses; and
- Use noise-reducing barriers or enclosures around stationary equipment when within 200 feet of receptors sufficient to achieve a 10-dBA reduction in noise levels.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail would result in less-than-significant noise impacts and no mitigation would be required. Construction of the project with the proposed access program along the southern skyline ridge trail could result in significant impacts related to noise. Implementation of Mitigation Measure M-NO-1, Construction Noise Reduction, would reduce noise impacts to a less-than-significant level. For the reasons presented, with implementation of the recommended mitigation measure, construction of the project with the proposed access program would have a less-than-significant impact related to noise.

Impact NO-2: Construction activities would not result in excessive groundborne vibration. (Less than Significant)

Some types of construction equipment can produce vibration levels that can cause architectural damage to structures and be annoying to nearby sensitive receptors. Vibration levels generated during construction would vary during the construction period, depending upon the construction activity and the types of construction equipment used. Typical vibration levels for the construction equipment that would generally result in the highest vibration levels (e.g., drill rig, large bulldozers) are presented in Table 4.5-9. Under the proposed access program and variant 1, the SFPUC would not construct new barbed-wire fencing along the Fifield-Cahill ridge trail between Cemetery Gate and Portola Gate. Under variants 2 and 3, SFPUC would construct fencing between these locations. Under the proposed access program and variants, the SFPUC would construct new and improve existing fencing along the southern skyline ridge trail. However, fencing installation would not be a substantial source of vibration along trail alignment, and would not influence the outcome of the vibration analysis. Using portable augers to install fence posts would generate the same vibration levels as analyzed below for large bulldozers. Conversely, under the proposed access program and variants, the project components with the highest construction vibration near sensitive receptors (e.g., access drives) would be the same.

The large bulldozers and drill rigs listed in Table 2-1 as equipment to be used would generate a peak particle velocity of approximately 0.089 and a root-mean-square amplitude of 87 at 25 feet. The nearest noise-sensitive receptors to any of the project elements would be approximately 100 feet (for construction of one southern skyline ridge trail access drive). At this distance, heavy equipment activity, such as bulldozer operations, could cause vibration levels of 0.019 peak particle velocity and 69 root mean square.

TABLE 4.5-9
VIBRATION VELOCITIES FOR CONSTRUCTION EQUIPMENT

Equipment Activity	Particle Peak Velocity at 25 Feet (inches/second)[a]	Root Mean Square at 25 Feet (VdB)[b]	Particle Peak Velocity at 100 Feet (inches/second)[a]	Root Mean Square at 100 Feet (VdB)[b]
Large Bulldozer/drill rig	0.089	87	0.019	69
Loaded Trucks	0.076	86	0.017	68
Jackhammer	0.035	79	0.008	61

NOTES:
[a] Buildings can be exposed to groundborne vibration levels of 0.2 peak particle velocity without experiencing structural damage.
[b] The human annoyance response level is 80 root mean square.

VdB = Vibration Decibels

SOURCE: Federal Transit Administration, 2006.

As shown in Table 4.5-9, vibration levels at the nearest sensitive receptor (100 feet) would not exceed the potential building damage threshold of 0.2 peak particle velocity or the annoyance threshold of 80 root mean square. Other sensitive receptors in the project vicinity would be exposed to vibration levels at incrementally lower levels than those calculated for the nearest receptors. Therefore, project construction would have a less-than-significant effect related to excessive groundborne vibration.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in less-than-significant impacts related to construction-related vibration. Mitigation is not required.

Operational Impacts

Impact NO-3: Project operations would not result in a substantial permanent increase in ambient noise levels at the closest receptors or expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance. (Less than Significant)

The management plan EIR considers the potential for operational activities associated with new trail facilities and amenities, including various access management options, to substantially increase noise levels at the location of any sensitive receptor over an extended period of time. The management plan EIR acknowledges potential noise increases associated with increased visitor traffic, ranger patrols, and public use of the trails. For most of these potential effects, the management plan EIR finds a less than significant impact. However, it does note the potential for

noise conflicts between cemetery users and trail users, particularly during funerals or gravesite visitations. The management plan EIR explains such conflicts could be significant. The management plan EIR recommends Project-Level Mitigation Measure L.1, which calls for aligning the trail in a manner that minimizes potential disturbances to Skylawn Memorial Park visitors, to reduce significant noise conflicts between cemetery and trail users impacts to a less-than-significant level.[23]

The following discussion evaluates potential operational noise impacts in light of the site-specific and project-level information that the SFPUC has developed since management plan EIR certification. As described below, notable project-related operational noise—namely that from visitors—would primarily occur around points of visitor congregation, such as parking lots and restrooms. At these locations, there are multiple noise sources, and people are more concentrated and generally stationary. In contrast, noise from visitors along the trail is more diffuse, as there tends to be fewer noise sources and people are less concentrated and in motion. For these reasons, under the proposed access program and variants, the project would not be expected to result in persistent noise conflicts between visitors traveling along the trail and cemetery visitors or neighboring residences along the trail, and no mitigation would be required.

As noted, operational noise would be generated primarily at two types of locations: parking lots and restrooms. First, noise would be generated at two proposed parking lots (20- and 50-vehicle lots) as vehicles arrive and park and then as passengers exit vehicles, close doors, and converse. The Federal Transit Administration identifies a screening distance of 150 feet[24] for parking facilities, beyond which no further noise assessment is necessary and impacts are deemed to be less than significant. As discussed above, the proposed 20- and 50-vehicle parking lots would be located more than 4,000 feet from the nearest residence and approximately 750 feet from the nearest plot within Skylawn Memorial Park (the four-vehicle lot would be farther). At these distances, and when considering intervening vegetation and topography, operational noise of parking facilities under the proposed access program and variants would be less than significant.

Noise would also be occasionally generated at restroom facilities while a vacuum service truck pumps out pit toilets. Pit toilets pumping would occur approximately on a weekly basis, and each pumping event would typically take about 10 minutes. The southernmost restroom along the southern skyline ridge trail would be located approximately 200 feet from the nearest noise receptor.

Noise from a vacuum service truck at the nearest receptor was modeled using Roadway Construction Noise Model, indicating a noise level of 64.3 dBA at the nearest receptor; vegetation and topography would further attenuate this noise. Based upon the modeling results, this analysis estimates that the resulting noise level would be similar in magnitude to that of a vehicle passing by along S.R. 35. Given the infrequency and short duration of vacuum truck operations, the vacuum truck noise would not constitute a substantial permanent noise increase. Additionally, the predicted noise level would be lower than the 65 dBA exterior noise standard for daytime hours established

[23] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.L, Noise (p. V-43); Section VI.L (p. VI-6).
[24] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment*, 2006, p. 4-3.

in chapter 4.88 of the San Mateo County Noise Ordinance. Therefore, project operation under the proposed access program and variants would result in a less-than-significant noise impact.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Project operation with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in-less-than-significant operational noise impacts. Mitigation is not required.

Cumulative Impacts

Impact C-NO-1: Construction of the project combined with cumulative construction noise in the project area would not cause a substantial temporary or periodic increase in ambient noise levels near the project area. (Less than Significant)

The geographic scope of analysis for cumulative noise and vibration construction impacts encompasses sensitive receptors within approximately 500 feet of the project site. Beyond 500 feet, the contributions of noise from other projects would be greatly attenuated through both distance and intervening vegetation and topography, and their contribution would be minimal. Section 4.1, Overview, presents the list of reasonably foreseeable future projects in the vicinity that could contribute to cumulative construction noise. All cumulative projects listed in Table 4.1-1 would occur more than 1,000 feet from any element of the project. Therefore, no other projects' effects would combine with the construction or operational noise effects of the project to result in a significant cumulative impact.

Mitigation: None required.

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4.6 Air Quality

This section describes the existing air quality environment in the project area and identifies the potential for air quality impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project under the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). Air quality concerns include increases in emissions of criteria air pollutants and exposure of sensitive receptors[1] to substantial pollutant concentrations or objectionable odors. Mitigation measures are identified to avoid or reduce significant adverse impacts. Section 4.7, Greenhouse Gas Emissions, evaluates impacts specific to greenhouse gas emissions and climate change.

During public scoping, only one comment was received on the topic of air quality. This comment concerned the impacts of heavy construction equipment on air quality and is considered in Section 4.6.3, Impacts and Mitigation Measures.

4.6.1 Environmental Setting

The air quality environmental setting for the project is entirely within the geographic extent of the setting characterized in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR). Consequently, the relevant setting information presented in the management plan EIR that remains valid is summarized, incorporated by reference, and not repeated herein. New environmental setting information is provided herein where it is relevant to and necessary for the impact analysis, reflects new information or changed circumstances from that presented in the management plan EIR, or to provide more specific detail to support a project-level analysis.

4.6.1.1 Background

The project area is located in unincorporated San Mateo County within the San Francisco Bay Area Air Basin, which comprises all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, as well as the southern portion of Sonoma County and the southwest portion of Solano County. Ambient concentrations of air pollutants in the project area are a product of the quantity of pollutants emitted by local sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect air quality and pollutant transport and dilution include terrain, wind, atmospheric stability, and the presence of sunlight.

[1] Land uses such as residences, schools, children's daycare centers, hospitals, and convalescent homes are considered most sensitive to air quality conditions. Please refer to Section 4.6.1.5 for more detail.

4.6.1.2 Meteorology

Atmospheric conditions such as wind speed, wind direction, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants. The climate of the Bay Area is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. During winter, the Pacific high-pressure system shifts southward, which allows more storms to pass through the region. During summer and early fall, when few storms pass through the region, emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and *subsidence inversions*[2] to create conditions that are conducive to the formation of photochemical pollutants, such as ozone, and secondary particulates, such as nitrates and sulfates.

More specifically, the project area lies within the Peninsula climatological subregion. San Mateo County's proximity to the onshore breezes stimulated by the Pacific Ocean provides for generally very good air quality in the project area.

Temperatures in the project area average in the mid-50s annually, generally ranging from the low-40s on winter mornings to mid-70s during summer afternoons. Daily and seasonal oscillations of temperature are small because of the moderating effects of the nearby San Francisco Bay and ocean. In contrast to the steady temperature regime, rainfall is highly variable and confined almost exclusively to the "rainy season" from November through April. Precipitation might vary widely from year to year as a shift in the annual storm track of a few hundred miles can mean the difference between a very wet year and drought conditions.

The publicly operated meteorological monitoring facility nearest the project area is operated by the Bay Area Air Quality Management District (air district), located at 897 Barron Avenue in Redwood City, approximately 7 miles east of the project area. This station has recorded an annual predominant wind speed of 5.7 miles per hour and an annual predominant northwesterly wind direction.

4.6.1.3 Ambient Air Quality

The air district operates a regional monitoring network that measures the ambient concentrations of six criteria air pollutants: *ozone*, *carbon monoxide* (CO), *particulate matter* (PM_{10} and $PM_{2.5}$), *nitrogen dioxide* (NO_2), and *sulfur dioxide* (SO_2). Existing air quality in the project area can best be inferred from examining ambient air quality measurements taken by the air district at monitoring stations in the vicinity of the project area. Table 4.6-1 presents a 5-year summary of monitoring data (2013–2017) from the Redwood City station. The table also compares measured maximum pollutant concentrations against the most stringent applicable ambient air quality standards (both state and federal standards are described below in Section 4.6.2, Regulatory Framework). However, it should be noted that due to the low density of development in the project area, there are fewer air

[2] Atmospheric subsidence occurs when normal upward flow of air in the atmosphere, known as atmospheric convection, is disturbed. A subsidence inversion develops when a widespread layer of air descends. The layer is compressed and heated by the resulting increase in atmospheric pressure, and as a result the lapse rate of temperature (average rate at which the temperature decreases with increase in altitude) is reduced.

pollution sources when compared to downtown Redwood City. Data for PM_{10} and SO_2 is not included in the table because these pollutants are not monitored at the Redwood City station.

TABLE 4.6-1
REDWOOD CITY MONITORING STATION – AMBIENT AIR QUALITY SUMMARY (2013–2017)

Pollutant	Standard	Number of Days Standards Were Exceeded and Maximum Concentrations Measured[a]				
		2013	2014	2015	2016	2017
Ozone						
Highest 1-hour Average (ppm)[b]	0.09 ppm[c]	0.083	0.086	0.086	0.075	**0.115**
Days over State Standard Exceedances[d]		0	0	0	0	2
Highest 8-hour Average (ppm)[b]	0.070 ppm[b]	0.075	0.065	0.071	0.060	**0.086**
Days over State Standard		0	0	1	0	2
Carbon Monoxide (CO)						
Maximum 1-hour Concentration (ppm)	>20[c]	3.6	3.2	3.4	2.2	2.8
Days 1-hour Standard Exceeded		0	0	0	0	0
Maximum 8-hour Concentration (ppm)	>9.0[c]	1.6	1.6	1.6	1.1	1.4
Days 8-hour Standard Exceeded		0	0	0	0	0
Fine Particulate Matter ($PM_{2.5}$)						
Highest 24-hour Average ($\mu g/m^3$)[b]	35 $\mu g/m^3$	**39.0**	35.0	34.6	19.5	**60.8**
Measured Days over National Standard Exceedances/Samples[d]		3	0	0	0	6
State Annual Average ($\mu g/m^3$)[b,c]	12 $\mu g/m^3$	--	7.2	6.0	8.3	9.1
National Annual Average ($\mu g/m^3$)[b,c]	12.0 $\mu g/m^3$	10.7	7.2	6.0	7.0	7.7
Nitrogen Dioxide (NO_2)						
Highest Hourly Average (ppm) [b]	0.18 ppm	0.054	0.055	0.048	0.046	0.067
Measured Days over State Standard Exceedances/Samples[d]		0	0	0	0	0

NOTES:

Bold values are in excess of applicable standard.
ppm = parts per million.
$\mu g/m^3$ = micrograms per cubic meter.

[a] Number of days exceeded is for all days in a given year, except for PM_{10}, which the air district monitors every 12 days, effective January 2013.
[b] Federal standard, not to be exceeded.
[c] State standard, not to be exceeded.
[d] Based on a sampling schedule of approximately 30 samples per year for PM_{10}. The air district monitors all other pollutants continuously, including $PM_{2.5}$.

SOURCE: Bay Area Air Quality Management District, 2017.

Ozone

Ozone is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving *reactive organic gases* (ROG) and *nitrogen oxides* (NO_X). Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately three hours. The main sources of NO_X and ROG, often referred to as ozone precursors, are combustion processes (including motor vehicle engines) and the evaporation of solvents, paints, and fuels. Automobiles are the single largest source of ozone precursors in the Bay Area.

Ozone is a regional air pollutant because its precursors are transported and diffused by wind concurrently with ozone production through the photochemical reaction process, resulting in the regional dispersion of ozone. Ozone concentrations tend to be higher in the late spring, summer, and fall, when the long sunny days combine with regional subsidence inversions to create conditions conducive to the formation and accumulation of secondary photochemical compounds like ozone. Ozone causes eye irritation, airway constriction, and shortness of breath and can aggravate existing respiratory diseases such as asthma, bronchitis, and emphysema.[3]

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as NO_X. A precursor to ozone formation, NO_X is produced by fuel combustion in motor vehicles, industrial stationary sources (such as refineries, power plants, and chemical manufacturing facilities), ships, aircraft, and rail transit. Typically, NO_X emitted from fuel combustion is in the form of *nitric oxide* (NO) and NO_2, with the vast majority (95 percent) of the NO_X emissions being composed of NO, which is converted to NO_2 in the atmosphere when it reacts with ozone or undergoes photochemical reactions.

Carbon Monoxide

Carbon monoxide (CO) is an odorless, colorless gas usually formed as the result of the incomplete combustion of fuels and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the blood's oxygen-carrying capacity. This reduces the amount of oxygen reaching the brain, heart, and other body tissues, which is especially problematic for people with cardiovascular diseases, chronic lung disease, and anemia.

[3] Bay Area Air Quality Management District, 2011. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2011. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

Suspended and Inhalable Particulate Matter

Particulate matter is a class of air pollutants that consists of solid and liquid airborne particles in an extremely small size range. Particulate matter is measured in two size ranges: PM_{10} for particles less than 10 microns[4] in diameter, and $PM_{2.5}$ for particles less than 2.5 microns in diameter. PM_{10} and $PM_{2.5}$ represent fractions of particulate matter that can be inhaled into air passages and the lungs and cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect.

Fine particulates small enough to be inhaled into the deepest parts of the human lung can cause adverse health effects. $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.[5] Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed, or adhered, gases (e.g., chlorides or ammonium) that might be harmful to health. Extended exposure to particulate matter can increase the risk of chronic respiratory disease. According to a study prepared by the California Air Resources Board (air board), exposure to ambient $PM_{2.5}$, particularly diesel particulate matter, might be associated with approximately 9,000 premature annual deaths statewide.[6] Particulate matter also can damage materials and reduce visibility.

4.6.1.4 Toxic Air Contaminants

Toxic air contaminants (TACs) are a defined set of airborne air pollutants that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. There are two categories of the most common sources of TACs: stationary sources such as back-up diesel generators, dry cleaners, and gasoline stations; on-road mobile sources from cars and trucks on high traffic volume roadways; and off-road mobile sources such as construction equipment, ships, and trains. Like $PM_{2.5}$, TACs can be emitted directly and can also be formed in the atmosphere through reactions with different pollutants. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or cause short-term acute effects such as eye watering, respiratory irritation (cough, runny nose, throat pain), and headaches.

The current California list of TACs includes approximately 200 compounds, including diesel particulate matter emissions, which was identified as a TAC and a human carcinogen by the air

4 The micron, or micrometer, is a unit of length equivalent to one millionth of a meter.
5 Bay Area Air Quality Management District, 2011. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2011.
6 California Air Resources Board, 2010. *Estimate of Premature Deaths Associated with Fine Particulate Pollution ($PM_{2.5}$) in California Using a U.S. Environmental Protection Agency Methodology*, August 31, 2010.

board in 1998.[7] Diesel particulate matter, a component of $PM_{2.5}$, accounts for over 80 percent of the inhalation cancer risk from TACs in the Bay Area and is one of the TACs of greatest concern regionally and throughout California. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the diesel soot particles, which are very small and can penetrate deep into the lungs. Several medical research studies have linked near-road pollution exposure to a variety of adverse health outcomes that affect children and adults, including significant allergic response and elevated production of specific antibodies.[8]

In the Bay Area, there are a number of areas where the exposure of sensitive populations to TACs is relatively high. The air district identifies these areas as "impacted communities." The project area is not located within any impacted community boundaries.

4.6.1.5 Sensitive Receptors

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are more sensitive than the general population to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. People engaged in strenuous work or exercise are also more sensitive to poor air quality. Residential areas are more sensitive to air quality conditions than commercial and industrial areas because people generally spend more time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses or parks are sensitive due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience.

There are no schools, childcare centers, churches, hospitals, or nursing homes located near the project area. The sensitive receptors nearest to the project site are rural residential uses along State Route 35 (S.R. 35).[9] These residences are the closest sensitive receptors to the project area; their locations are noted in Table 4.5-2 of Section 4.5, Noise and Vibration.

4.6.2 Regulatory Framework

This section describes the federal, state, and local regulations applicable to project construction and operation. The management plan EIR considers the local (county) air quality regulations applicable to the project; some of these regulations remain valid and are therefore summarized and not repeated in this EIR. Updated local air quality regulations that the management plan EIR did not present are added below to provide a thorough discussion of the regulatory framework with respect to air quality.

7 California Air Resources Board, 2015. Toxic Air Contaminant Identification List. *http://www.arb.ca.gov/toxics/id/taclist.htm.* Accessed February 2016.
8 Bay Area Air Quality Management District, 2011. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2011.
9 S.R. 35 is also Skyline Boulevard in this location.

Established federal, state, and regional regulations provide the framework for analyzing and controlling air pollutant emissions and thus general air quality. The U.S. Environmental Protection Agency (U.S. EPA) is responsible for implementing the programs established under the federal Clean Air Act, such as establishing and reviewing the federal ambient air quality standards and reviewing State Implementation Plans, described further below. However, the U.S. EPA has delegated the authority to implement many of the federal programs to the states, while retaining an oversight role to ensure that states continue to implement the programs. In California, the air board is responsible for establishing and reviewing the state ambient air quality standards, developing and managing the California implementation plan, securing approval of this plan from the U.S. EPA, and identifying TACs. The air board also regulates mobile emissions sources in California, such as construction equipment, trucks, and automobiles, and oversees the activities of air quality management districts, which are organized at the county or regional level. An air quality management district is primarily responsible for regulating stationary emission sources at facilities within its geographic areas and for preparing the air quality plans that are required under the federal Clean Air Act and 1988 California Clean Air Act. The Bay Area air district is the regional agency with regulatory authority over emission sources in the nine-county San Francisco Bay Area.

4.6.2.1 Federal and State Regulations

Criteria air pollutants are regulated by both national and state ambient air quality standards and emissions limits for individual sources. Regulations implementing the federal Clean Air Act and its subsequent amendments established national ambient air quality standards for six criteria pollutants: ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. California has adopted more stringent state ambient air quality standards for some of the criteria air pollutants. In addition, California has established state ambient air quality standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, as shown in Table 4.6-2.

The ambient air quality standards are intended to protect public health and welfare, and they incorporate a margin of safety. They are designed to protect those segments of the public most susceptible to respiratory distress, including people with asthma, the very young, elderly, people weak from other illness or disease, or persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollution levels somewhat above the ambient air quality standards before adverse health effects are observed.

Attainment Status

Under amendments to the federal Clean Air Act, the U.S. EPA has classified air basins or portions thereof as either "attainment" or "non-attainment" for each criteria air pollutant, based on whether the national standards have been achieved. The California Clean Air Act, which is patterned after the federal Clean Air Act, also requires areas to be designated as "attainment" or "non-attainment" for the state standards. Thus, areas in California have two sets of attainment/non-attainment designations: one set with respect to the national standards and one set with respect to the state standards. Table 4.6-2 shows the attainment status of the San Francisco Air Basin with respect to the national and state ambient air quality standards for different criteria pollutants.

TABLE 4.6-2
AMBIENT AIR QUALITY STANDARDS AND SAN FRANCISCO AIR BASIN ATTAINMENT STATUS

Pollutant	Averaging Time	State Standard	SF Air Basin Attainment Status for California Standard	Federal Primary Standard	SF Air Basin Attainment Status for Federal Standard
Ozone	8 Hour	0.070 ppm	Non-attainment	0.070 ppm	Non-attainment
	1 Hour	0.09 ppm	Non-attainment	N/A	N/A
Carbon Monoxide (CO)	8 Hour	9.0 ppm	Attainment	9 ppm	Attainment
	1 Hour	20 ppm	Attainment	35 ppm	Attainment
Nitrogen Dioxide (NO_2)	Annual Average	0.030 ppm	N/A	0.053 ppm	Attainment
	1 Hour	0.18 ppm	Attainment	0.100 ppm	Unclassified
Sulfur Dioxide (SO_2)	Annual Average	N/A	N/A	0.030 ppm	Attainment
	24 Hour	0.04 ppm	Attainment	0.14 ppm	Attainment
	1 Hour	0.25 ppm	Attainment	0.075 ppm	Attainment
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	Non-attainment	N/A	N/A
	24 Hour	50 µg/m^3	Non-attainment	150 µg/m^3	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	Non-attainment	12.0 µg/m^3	Attainment
	24 Hour	N/A	N/A	35 µg/m^3	Non-attainment
Sulfates	24 Hour	25 µg/m^3	Attainment	N/A	N/A
Lead	Calendar Quarter	N/A	N/A	1.5 µg/m^3	Attainment
	30-Day Average	1.5 µg/m^3	Attainment	N/A	N/A
	3-Month Rolling Average	N/A	N/A	0.15 µg/m^3	Unclassified
Hydrogen Sulfide	1 Hour	0.03 ppm	Unclassified	No Federal Standard	N/A
Vinyl Chloride	24 Hour	0.010 ppm	No information available	N/A	N/A
Visibility-Reducing Particles	8 Hour	Extinction coefficient of 0.23/km[a] visibility of 10 miles or more	Unclassified	No Federal Standard	N/A

NOTES: km = kilometer;
µg/m^3 = micrograms per cubic meter;
N/A = not applicable;
ppm = parts per million;
SF = San Francisco;
Unclassified = not classified as attainment or non-attainment;

[a] Particles present in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70 percent. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

SOURCE: Bay Area Air Quality Management District, 2017.

Federal Regulations

The U.S. EPA is responsible for implementing programs established by the federal Clean Air Act, such as establishing and reviewing the National Ambient Air Quality Standards for the following air pollutants: CO, ozone, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The federal Clean Air Act also requires the U.S. EPA to designate areas (counties or air basins) as attainment or non-attainment with respect to each criteria pollutant, depending on whether the area meets the air quality standards. If an area is designated as non-attainment, it does not meet the air quality standards and is required to create and maintain an implementation plan for achieving compliance with the air quality standards. Conformity to the implementation plan is defined under the 1990 Clean Air Act amendments as conformity with the plan's purpose in eliminating or reducing the severity and number of violations of the air quality standards and achieving expeditious attainment of these standards. Air quality within the San Francisco Air Basin does not attain the federal standards for ozone and $PM_{2.5}$.

State Regulations

The California Air Resources Board is the state agency responsible for regulating air quality. Its responsibilities include establishing state ambient air quality standards, emissions standards, and regulations for mobile emissions sources (e.g., automobiles, trucks), in addition to overseeing the efforts of countywide and multicounty air pollution control districts, which have primary responsibility over stationary sources. The emission standards most relevant to the project are those related to on- and off-road, heavy-duty diesel engines. The air board also regulates vehicle fuels with the intent of reducing emissions; it has set emission reduction performance requirements for gasoline (California reformulated gasoline) and limited the sulfur and aromatic content of diesel fuel to make it burn cleaner. The air board also sets the standards used to pass or fail vehicles in smog-check and heavy-duty truck inspection programs.

In 1988, California passed the California Clean Air Act (California Health and Safety Code section 39600 et seq.), which, like its federal counterpart, called for the designation of areas as attainment or nonattainment, but based on the state ambient air quality standards rather than the federal standards. As shown in Table 4.6-2, the Bay Area is nonattainment of state standards for ozone, PM_{10}, and $PM_{2.5}$ because these standards are exceeded periodically. The California Clean Air Act requires that air districts in which state air quality standards are exceeded must prepare a plan that documents reasonable progress towards attainment. In the Bay Area, this planning process is incorporated into the Clean Air Plan. The Bay Area air district adopted the most recent version of the Clean Air Plan in 2017 (see discussion below under *Bay Area Air Quality Management District*).

4.6.2.2 Local Regulations

Bay Area Air Quality Management District

The Bay Area Air Quality Management District is the regional agency responsible for air quality regulation within the San Francisco Bay Area Air Basin (air basin), by regulating air quality through planning and review activities. The air district has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, impose emission limits, set

fuel or material specifications, or establish operational limits to reduce emissions. The air district regulates new or expanding stationary sources of toxic air contaminants.

In April 2017, the air district adopted the 2017 Clean Air Plan.[10] The plan's primary goals are to protect public health and the climate. The plan includes a wide range of proposed control measures, which consist of actions to reduce combustion-related activities, decrease fossil fuel combustion, improve energy efficiency, and decrease emissions of potent greenhouse gases. The 2017 Clean Air Plan updates the Bay Area 2010 Clean Air Plan and complies with state air quality planning requirements as codified in the California Health and Safety Code. The air basin is designated non-attainment for both the one- and eight-hour state ozone standards. In addition, emissions of ozone precursors in the air basin contribute to air quality problems in neighboring air basins. Under these circumstances, state law requires the Clean Air Plan to include all feasible measures to reduce emissions of ozone precursors and to reduce the transport of ozone precursors to neighboring air basins.

The 2017 Clean Air Plan contains 85 measures to address the reduction of several pollutants: ozone precursors, particulate matter, air toxics, and greenhouse gases. Other measures focus on a single type of pollutant, potent greenhouse gases such as methane and black carbon, or harmful fine particles that affect public health. These control strategies that can be grouped into the following categories:

- Stationary source
- Transportation
- Energy
- Building
- Agricultural
- Natural and working lands
- Waste management
- Water
- Super greenhouse gases[11]

In response to Senate Bill 636, the air district completed the Particulate Matter Implementation Schedule in November 2005. The implementation schedule evaluates the applicability of the 103 PM control measures on the air board's list and discusses how the air district implements applicable measures. The air district implements a number of regulations and programs to reduce PM emissions, such as controlling dust from earthmoving and construction/demolition operations, limiting emissions from various combustion sources such as cement kilns and furnaces, and reducing PM emissions from composting and chipping activities. In addition to limiting stationary sources, the air district implements a variety of mobile source incentive programs to encourage fleet operators and the public to purchase low-emission vehicles, re-power old polluting heavy duty diesel engines, and install after-market emissions control devices to reduce particulates and NO_x emissions.

10 Bay Area Air Quality Management District, *Draft 2017 Clean Air Plan, Spare the Air, Cool the Climate*, 2017. *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/baaqmd_2017_cap_draft_122816-pdf.pdf?utm_campaign=CAP+2017+Draft&utm_medium=email&utm_content=article3_link1*. Accessed on January 13, 2017.

11 Certain climate pollutants, such as methane, black carbon, and fluorinated gases, are especially potent and play an important role in heating the climate in the near term. Throughout this plan, we refer to these climate pollutants as "super-greenhouse gases" to reflect their powerful ability to contribute to global warming.

Odors

The air district is responsible for investigating odor complaints in the air basin. Upon receipt of a complaint, the air district sends an investigator to interview the complainant and locate the odor source if possible. The air district Regulation 1, Rule 301 is the nuisance provision that states that sources cannot emit air contaminants that cause nuisance to a considerable number of persons or the public. The air district enforces odor control by helping the public document a public nuisance. The air district typically brings a public nuisance court action when there are a significant number of confirmed odor events within a 24-hour period. A finding of public nuisance is punishable by fine. California Health and Safety Code section 41700 also prohibits emissions that cause odors, health problems, property damage, or other nuisance.

4.6.3 Impacts and Mitigation Measures

4.6.3.1 Significance Criteria

The project would have a significant impact related to air quality if it were to:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal, state, or regional ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Expose sensitive receptors to substantial pollutant concentrations;
- Result in a cumulative air quality impact in combination with past, present, and probable future projects in the vicinity; or
- Create objectionable odors that affect a substantial number of people.

4.6.3.2 Approach to Analysis

This air quality impact analysis considers construction and operational impacts associated with the project. Construction and operations-related impacts are evaluated in accordance with the air district's CEQA Air Quality guidelines for assessing and mitigating air quality impacts.[12] In June 2010, the air district adopted new recommended CEQA guidelines for assessing air quality impacts, with revisions adopted in May 2011. These thresholds include quantitative CEQA significance thresholds for emissions of criteria pollutants, ozone precursors, and TACs during project construction and operations.[13] The guidelines were the subject of litigation, with the Alameda County Superior Court striking down the guidelines, the Court of Appeal upholding the guidelines, and the California Supreme Court ultimately concluding that with a few specific

[12] Bay Area Air Quality Management District, 2011. *California Environmental Quality Act Air Quality Guidelines*. Updated May 2011.
[13] Ibid.

statutory exceptions, agencies subject to CEQA generally are not required to analyze the impact of existing environmental conditions on a project's future users or residents, thereby reversing the Court of Appeal's judgment on that issue. The air district has not reinstated its guidelines, which it withdrew after the Superior Court decision, or revised its guidelines to reflect the California Supreme Court decision. As the Court of Appeal has upheld the guidelines in all other respects, a ruling that stands, the San Francisco Planning Department has determined that significance thresholds provided in the air district's CEQA Air Quality guidelines, which were updated in 2011, are adequate for use in this analysis.

CEQA does not generally require lead agencies to consider how existing environmental conditions might affect a project's users or residents, except where the project would significantly exacerbate an existing environmental condition. Accordingly, the significance criteria above related to exposure of sensitive receptors to substantial pollutant concentrations is relevant only to the extent that the project exacerbates air quality conditions. The impact is considered significant if the project would exacerbate existing or future air quality conditions.

Equipment, trucks, worker vehicles, and ground-disturbing activities associated with construction of the project would generate emissions of criteria air pollutants and precursors. The construction-related exhaust emissions were quantified and compared to the daily criteria air pollutant emissions significance thresholds, as shown in Table 4.6-3 for construction activities.

TABLE 4.6-3
CRITERIA AIR POLLUTANT EMISSIONS SIGNIFICANCE THRESHOLDS

Pollutant	Construction Thresholds	Operational Thresholds	
	Average Daily Emissions (lbs./day)	Average Daily Emissions (lbs./day)	Maximum Annual Emissions (tons/year)
Reactive Organic Gases (ROG)	54	54	10
Nitrogen Oxides (NO_x)	54	54	10
Respirable Particulate Matter (PM_{10})	82 (exhaust)	82	15
Fine Particulate Matter ($PM_{2.5}$)	54 (exhaust)	54	10
Fugitive Dust [a]	Construction Dust Ordinance or other Best Management Practices	Not Applicable	

NOTE:
[a] Fugitive dust is a specific subset of non-exhaust generated particulate emissions that are generated by material process activity such as rock crushing or result from open transport, storage, and transfer of raw, intermediate, and waste aggregate materials, and nonindustrial sources such as unpaved roads and parking lots, paved streets and highways, heavy construction activities, and agricultural tilling.

The significance thresholds for criteria pollutant and ozone precursor (ROG and NOx) emissions associated with project operations are also shown in Table 4.6-3. These represent the levels at which the air district has determined that a project's individual emissions of criteria air pollutants would substantially contribute to the air basin's existing air quality violations. If daily average or maximum annual operational emissions would exceed any applicable thresholds of significance shown in Table 4.6-3, the project would result in a significant impact.

This air quality analysis estimates criteria pollutant emissions associated with project operations and compares them to the average and annual significance thresholds. The analysis also evaluates the significance of the project's criteria pollutant contributions to cumulative operational emissions in the air basin.

This analysis assesses exposure of sensitive receptors to substantial pollutant concentrations with respect to construction-related emission of diesel particulate matter. The analysis considers both the distance of receptors from construction areas and the durations of such exposures with respect to guidance published by the state Office of Environmental Health Hazard Assessment. The analysis in the management plan EIR states that operational air pollutant emissions were not discussed in that document because operation of management plan components would not significantly change trip distribution patterns in the project area, significantly increase vehicular traffic, or affect regional PM_{10} concentrations and that, ultimately, emissions from facility operations would be negligible and result in no discernible change in air quality. Notwithstanding this finding, the following analysis includes an assessment of emissions from operational trip generation and associated vehicle miles travelled that would result from new trails and infrastructure attracting more park visitors.

4.6.3.3 Impact Summary

Table 4.6-4 summarizes the air quality-related impacts of the project; this table provides separate significance determinations for the proposed access program and variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access).

TABLE 4.6-4
SUMMARY OF IMPACTS – AIR QUALITY

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact AQ-1: Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation.	LSM	LSM	LSM	LSM
Impact AQ-2: Project construction activities would not create objectionable odors that affect a substantial number of people.	LS	LS	LS	LS
Impact AQ-3: Project construction activities would not expose sensitive receptors to substantial pollutant concentrations.	LS	LS	LS	LS
Impact AQ-4: Emissions generated during project operation would not violate air quality standards and contribute substantially to an existing air quality violation.	LS	LS	LS	LS
Impact AQ-5: Project operations would not create objectionable odors that affect a substantial number of people.	LS	LS	LS	LS

TABLE 4.6-4 (CONTINUED)
SUMMARY OF IMPACTS – AIR QUALITY

Impacts	Significance Determinations			
	Proposed Access Program	Access Program Variant 1 (Docent Program)	Access Program Variant 2 (Unsupervised/ Unrestricted Access)	Access Program Variant 3 (Unsupervised/ Restricted Access)
Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan.	LSM	LSM	LSM	LSM
Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions.	LSM	LSM	LSM	LSM

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.6.3.4 Impact Analysis

Construction Impacts

The management plan EIR considers the potential effects of project construction on air quality. That EIR concludes that the potential effects of construction would be less than significant by virtue of implementation of action des9, which identifies best management practices for control of emissions of fugitive dust. These practices align with similar measures published by the air district for reducing potentially significant fugitive dust emissions to a less than significant level. Since certification of the management plan EIR, the SFPUC has developed additional site-specific and project-level details that allow for closer examination of the project's potential for impacts on air quality. In addition, the air district has published mass emission thresholds for construction activities that were not yet developed during the management plan's environmental review period. Accordingly, this EIR presents an updated and refined analysis with consideration of the management plan EIR's findings, changes to the protocol for assessing impacts to air quality, and additional project description information.

Impact AQ-1: Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation. (Less than Significant with Mitigation)

The project implementation would involve construction of trails, parking lots, access driveways, restrooms, and security features. Construction would take approximately 12 months, with the proposed improvements to the Fifield-Cahill ridge trail occurring concurrently with construction of the southern skyline ridge trail and associated facilities. Construction activities would generate fugitive dust (including PM_{10} and $PM_{2.5}$) during excavation, grading, spoils placement, and vehicle travel on both paved and unpaved surfaces. Other criteria pollutants would also be generated from the exhaust emissions of construction equipment and vehicles. Without controls, emissions of these criteria pollutants could contribute to the air basin's non-attainment status relative to state and federal air quality standards.

Multiple sources would generate construction emissions, including heavy mobile equipment and delivery/haul trucks, and worker vehicles. The analysis calculated construction-related criteria pollutant emissions for the project as a function of construction activity, construction duration, average haul truck mileage, and worker trips (automobile/light-truck mileage). Emissions from construction equipment were estimated using CalEEMod version 2016.3.2 and preliminary construction information, such as number and types of construction equipment and their activity levels provided by the SFPUC for the project (see Table 2-1 of the Project Description).

Table 4.6-5 summarizes the project's estimated average daily construction emissions separately for the proposed access program and variant 1, and for variants 2 and 3. The proposed access program and variant 1 (docent program) would not include new fencing for the Fifield-Cahill ridge trail. Consequently, as the table shows, the proposed access program and variant 1 would have slightly lower emissions than for variants 2 and 3, on account of the reduced use of equipment and vehicles for trimming vegetation along the fencing alignment, setting fence posts, and stringing barbed wire. The table also shows that average daily emissions of all criteria pollutants associated with project construction would exceed significance thresholds for emissions of NOx, which would be a significant impact for the proposed access program and variants. The implementation of Mitigation Measure M-AQ-1a, Tier 4 Engines for Selected Equipment, during project construction would reduce this impact to a less-than-significant level by ensuring the reduction of NOx emissions from primary pieces of off-road construction equipment.

TABLE 4.6-5
AVERAGE DAILY EMISSIONS OF CRITERIA POLLUTANTS DURING PROJECT CONSTRUCTION

Construction Emissions	Reactive Organic Gases (ROG)	Nitrogen Oxides (NO_X)	Respirable Particulate Matter (PM_{10}) Exhaust	Fine Particulate Matter ($PM_{2.5}$) Exhaust
Unmitigated Project Average Daily Emissions[a] (pounds/day)				
Unmitigated project total emissions for proposed access program and variant 1	9.58	110.57	5.08	4.68
Unmitigated project total emissions for access program variants 2 and 3	9.83	111.27	5.15	4.75
Significance Thresholds	54	54	82	54
Exceeds Thresholds?	No	Yes	No	No
Mitigated Project Average Daily Emissions[a] (pounds/day)				
Mitigated project total emissions for proposed access program and variant 1	4.87	53.24	2.29	2.12
Mitigated Project total emissions for access program variants 2 and 3	5.19	53.95	2.36	2.19
Significance Thresholds	54	54	82	54
Exceeds Thresholds?	No	No	No	No

NOTE:
[a] Average daily emissions include construction equipment emissions as well as emissions from both on-road and onsite truck activities.

SOURCE: See Appendix B of this EIR.

In addition to exhaust emissions, construction activities would generate emissions of fugitive dust associated with grading and earth disturbance and travel on paved and unpaved roads. With regard to fugitive dust emissions, the air district guidelines focus on implementation of recommended dust control measures rather than a quantitative comparison of estimated emissions to a significance threshold. For all projects, the air district recommends implementation of its Basic Construction Measures regardless of whether construction-related exhaust emissions exceed the applicable significance thresholds. Implementation of Mitigation Measure M-AQ-1b, Bay Area Air Quality Management District Basic Construction Measures during construction would reduce this impact to a less-than-significant level by requiring dust control through best management practices.

Mitigation Measure M-AQ-1a applies to construction of all project components under the proposed access program and variants.

Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.

A. Engine Requirements.

All excavators, bulldozers, and scrapers used in project construction shall have engines that meet the U.S. EPA or California Air Resources Board Tier 4 off-road emission standards. If engines that comply with Tier 4 off-road emission standards are not commercially available, then the project sponsor shall provide the next cleanest piece of off-road equipment as provided by the step-down schedules in Table M-AQ-1-1. The project sponsor shall submit documentation to the ERO of the following: 1) evidence that the Tier 4 equipment is not commercially available, identification of the compliance alternative in Table M-AQ-1-1 to be implemented, and analysis demonstrating that the compliance alternative would not exceed the significance threshold for NOx of an average of 54 lbs/day.

B. Waivers.

The ERO may waive the equipment requirements of subsection A if: a particular piece of off-road equipment is technically not feasible; the equipment would not produce desired emissions reduction due to expected operating modes; installation of the equipment would create a safety hazard or impaired visibility for the operator; or, there is a compelling emergency need to use other off-road equipment. If the ERO grants the waiver, the contractor must use the next cleanest piece of off-road equipment with alternative fueling, according to Table M-AQ-1-1, below.

TABLE M-AQ-1-1
OFF-ROAD EQUIPMENT COMPLIANCE STEP-DOWN SCHEDULE

Compliance Alternative	Engine Emission Standard	Emissions Control
1	**Tier 4 (interim)**	**Use renewable diesel**
2	Tier 3	Use renewable diesel
3	Tier 2	Use renewable diesel

How to use the table: If the Tier 4 emissions standards cannot be met for each piece of off-road equipment, then the project sponsors would need to meet Compliance Alternative 1. Should the project sponsors not be able to supply off-road equipment meeting Compliance Alternative 1, then Compliance Alternative 2 would need to be met.

SOURCE: San Francisco Environmental Planning, *Air Quality Mitigation Measure Guidance*, 2017.

The ERO may also waive the equipment requirements of subsection A if: a particular piece of off-road equipment with an engine meeting Tier 4 Final emission standards is not regionally available to the satisfaction of the ERO. If seeking a waiver from this requirement, the project sponsor must demonstrate to the satisfaction of the ERO that the average daily emissions of NOx from project construction sources does not exceed a total of 54 pounds per day.

Use of renewable diesel is only required for equipment that does not meet the Tier 4 Final engine specification. With respect to renewable diesel, "commercially available" shall mean the availability taking into consideration factors such as: (a) critical path timing of construction; (b) geographic proximity of fuel source to the project site; and (c) cost of renewable diesel being within 10 percent of Ultra Low Sulfur Diesel #2 market price.

The project sponsor shall maintain records concerning its efforts to comply with this requirement.

Mitigation Measure M-AQ-1b applies to construction of all project components under the proposed access program and variants.

Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.

To limit dust, criteria pollutants, and precursor emissions associated with project construction, the following Bay Area air district-recommended Basic Construction Measures shall be included in all construction contract specifications for the project:

- All exposed surfaces exclusive of trail areas (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.
- All haul trucks transporting soil, sand, or other loose material off site shall be covered.
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour.
- All paving shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes (as required by the California airborne toxics control measure in title 13, section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- Post a publicly visible sign at the project site entrance with the telephone number and person to contact at the SFPUC regarding dust complaints. This person shall respond

and take corrective action within 48 hours. The Bay Area Air Quality Management District's phone number shall also be visible to ensure compliance with applicable regulations.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail could result in significant impacts related to emission of construction-related criteria air pollutants and fugitive dust. Implementation of Mitigation Measure M-AQ-1a, Tier 4 Engines for Selected Equipment and Mitigation Measure M-AQ-1b, Bay Area Air Quality Management District Basic Construction Measures would reduce impacts from construction-related emissions of criteria air pollutants to a less-than-significant level. For the reasons presented, with implementation of recommended mitigation, construction of the project with the proposed access program would have a less-than-significant impact on air quality.

Impact AQ-2: Project construction activities would not create objectionable odors that affect a substantial number of people. (Less than Significant)

Project construction would not involve any activities that could cause water to stagnate and create potential odors. Combustion emissions from the use of diesel fuel in construction equipment, as well as tar or asphalt used for parking lot paving under the proposed access program and variants, could generate localized odors, but this would not affect a substantial number of people due to the distance (200 to 1,000 feet) between the source and the receptors. Even if bicyclists and motorists traveling along S.R. 35 or people at nearby residences temporarily perceived odors (although this is not likely), any such odors would not affect a substantial number of people. Therefore, the project's construction impacts related to objectionable odors would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in less-than-significant impacts from construction-related odor emissions. Mitigation is not required.

Impact AQ-3: Project construction activities would not expose sensitive receptors to substantial pollutant concentrations. (Less than Significant)

Under the proposed access program and variants, project construction activities would generate TAC emissions of diesel particulate matter from operation of equipment and vehicles. Construction-related TAC emissions could affect existing offsite receptors. Trail construction would progress at a rate of approximately 100 feet per day. Therefore, any one receptor would

only be exposed to TAC emissions or diesel particulate matter that exceed applicable standards for one to two weeks as trail construction work approaches and recedes. The duration of exposure from trail construction activities would be well below the of minimum two months recommended by the Office of Environmental Health Hazard Assessment for conducting a health risk analysis.[14] Similarly, the SFPUC estimates that restroom facilities construction would occur over a two-week period, which would also be less than the two-month exposure cutoff recommended by the environmental health office. Consequently, under the proposed access program and variants, trail construction activities would have a less-than-significant-impact related to exposure of sensitive receptors to substantial pollutant concentrations.

The parking facilities construction activities would be more than 1,000 feet from the nearest sensitive receptor. The air district considers the relevant zone of influence for an assessment of air quality health risks to be within 1,000 feet of a project site. Consequently, for the proposed access program and variants, construction of the parking facilities would have a less-than-significant-impact related to exposure to diesel particulate matter and $PM_{2.5}$. For the reasons presented above, project construction under the proposed access program and variants would not expose sensitive receptors to substantial pollutant concentrations, and this impact would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in less-than-significant impacts related to exposure of sensitive receptors to substantial pollutant concentrations. Mitigation is not required.

Operational Impacts

Impact AQ-4: Emissions generated during project operation would not violate air quality standards and contribute substantially to an existing air quality violation. (Less than Significant)

When operational, the project would generate regional emissions from visitor motor vehicle trips, work trips by SFPUC docents (under the proposed access program and variant 1), as well as maintenance trucks to service the trails, fencing, and restrooms. Visitor motor vehicle trips would represent the greatest contributor to operational emissions impacts. As discussed in Section 2.7.1, Trail Access Management Program and Visitation, project visitation would vary by access program, based upon level of access restriction. As explained in Section 2.7.1, an access program that would restrict visitation to docent-led access would result in the fewest number of visitors (see Section 2.7.1.2, *Access Program Variant 1 [Docent Program]*), whereas a program that would have unsupervised and unrestricted visitation would result in the greatest number of visitors (see

[14] California Environmental Protection Agency, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessment*, February 2015. *http://oehha.ca.gov/air/hot_spots/2015/2015GuidanceManual.pdf.* Accessed March 31, 2017.

Section 2.7.1.3, *Access Program Variant 2 [Unsupervised/Unrestricted Access]*). Accordingly, an access program with some restrictions, such as the proposed access program (docent-led access along Fifield-Cahill ridge trail; unsupervised/restricted access along southern skyline ridge trail) would have emissions similar to but slightly lower than unsupervised/unrestricted access. As discussed below, visitor emissions would not be substantial under any access program configuration. Therefore, this section presents a quantitative analysis of emissions associated with the lowest (docent-led) and highest (unsupervised/unrestricted) potential visitation for the access programs under consideration. This approach effectively bookends the range of potential emissions across all access program configurations, including the proposed access program.

With docent-led access, a maximum of 12,480 visitors per year could visit each of the project trails (i.e., Fifield-Cahill ridge trail and southern skyline ridge trail), for a total of 24,960 visitors per year. This analysis assumes that each visit would generate one trip to the parking areas and one trip home and that, based on visitor surveys for the Fifield-Cahill ridge trail under the existing docent program,[15] the estimated average trip length would be 18.9 miles. This is equivalent to 49,920 one-way trips per year. With unsupervised/unrestricted access, up to approximately 50,020 visitors per year could visit the project trails (i.e., Fifield-Cahill ridge trail and southern skyline ridge trail). This analysis assumes that each visit would generate one trip to the parking areas and one trip home. Based on prospective visitor surveys to estimate visitation without supervision or restriction,[16] the estimated average trip length would be 12 miles. This is equivalent to 100,040 one-way trips per year.

This EIR's analysis used the CalEEMod emissions estimator model (version 2016.3.2) to estimate emissions of criteria air pollutants from vehicle trips. Default values for truck percentages were left in place because the project would generate some truck emissions for restroom maintenance. Based on prospective visitor surveys to account for the regional draw of open space, this analysis increased the default trip length for the Bay Area from 7.3 to 18.9 miles for docent-led trails and to 12 miles for unrestricted trails. Table 4.6-6 presents the estimated emissions for docent-led access and unsupervised/unrestricted access. As this table shows, operational emissions of ROG, NOx, PM_{10}, and $PM_{2.5}$ for the access program configurations with the lowest and highest potential visitation (which correspond to variant 1 and variant 2, respectively) are all estimated to be lower than the significance thresholds. Therefore, operational emissions of criteria pollutants under the project with any of the access configurations (i.e., proposed access program or variants 1 through 3) would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Project operation with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in less-than-significant impacts related to operational emissions of criteria air pollutants. Mitigation is not required.

15 CHS Consulting Group, Travel Demand and Vehicles Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

16 Ibid.

TABLE 4.6-6
AVERAGE DAILY EMISSIONS OF CRITERIA POLLUTANTS DURING OPERATIONS

Construction Emissions	Reactive Organic Gases (ROG)	Nitrogen Oxides (NO_X)	Respirable Particulate Matter (PM_{10})	Fine Particulate Matter ($PM_{2.5}$)
Docent-led Access				
	Unmitigated Project Average Daily Emissions (pounds/day)			
Unmitigated Project Total Emissions	0.35	1.27	1.93	0.53
Significance Thresholds	54	54	82	54
Exceeds Thresholds?	No	No	No	No
Unrestricted/Unsupervised Access				
	Unmitigated Project Average Daily Emissions (pounds/day)			
Unmitigated Project Total Emissions	0.52	1.77	2.45	0.67
Significance Thresholds	54	54	82	54
Exceeds Thresholds?	No	No	No	No

SOURCE: CalEEMod 2016; See Appendix B of this EIR.

Impact AQ-5: Project operations would not create objectionable odors that affect a substantial number of people. (Less than Significant)

Odors could be occasionally generated at restroom facilities and during vault toilet pumping by a vacuum service truck. Toilet pumping would occur approximately on a weekly basis, and each pumping would typically take about 10 minutes. The southernmost restroom along the southern skyline ridge trail would be located approximately 200 feet downwind and across S.R. 35 from the nearest receptor. There are approximately five residences within 800 feet of the southernmost vault toilet proposed location.

Project plans indicate that vent pipes for the restroom would be approximately 12 feet above grade and be a Cascadian model manufactured by CXT. The maintenance manual indicates that these vault buildings implement a "Sweet Smelling Technology" that was invented by the U.S. Forest Service to facilitate maximum airflow through a structure to reduce smells and odors within the restroom.[17]

Given the distance from the nearest sensitive receptors, the height of the vent pipe, the odor-reducing technology, and the small number of potentially affected receptors, the project would have a low potential to generate noticeable odors. Even if noticeable, the odors would not affect a substantial number of people.

Moreover, existing regulations ensure that odor impacts do not affect a substantial number of people. The air district enforces its Regulation 7, which prohibits the discharge of any odorous

[17] Romtec, Sweet Smelling Technology FAQ, 2017. *http://romtec.com/blog-categories/sweet-smelling-technology/*. Accessed June 26, 2018.

substance that causes the ambient air at or beyond the property line of such person to be odorous and to remain odorous after dilution with four parts of odor-free air. However, the regulation specifies that its limitations are not applicable until the air district "receives odor complaints from 10 or more complainants within a 90-day period alleging that a person has caused odors perceived at or beyond the property line of such person and deemed to be objectionable by the complainants in the normal course of their work, travel, or residence." In the unlikely event that the air district were to receive enough odor complaints to require odor abatement, available measures to further reduce odors consist of (a) attaching an activated carbon filter at the vent stack, (b) attaching a biological filter at the vent stack, or (c) relocating the vent stack to a downwind remote area by extending it using an underground pipe.[18] Because there is an existing regulatory mechanism to address potential odor complaints, and the number of potentially affected people would not be substantial, this impact would be less than significant under the proposed access program and variants.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Project operation with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in a less than significant impact related to operational odor emissions. Mitigation is not required.

Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan. (Less than Significant with Mitigation)

The most recently adopted air quality plan for the air basin is the air district's 2017 Clean Air Plan, which is a comprehensive plan aimed at improving Bay Area air quality and protecting public health. The Clean Air Plan defines a control strategy for implementation by the air district to reduce emissions and decrease ambient concentrations of harmful pollutants (ground-level ozone and its key precursors, ROG and NO_x), as well as to safeguard public health by reducing exposure to the air pollutants that pose the greatest health risks (particulate matter, primarily $PM_{2.5}$ and precursors to secondary $PM_{2.5}$) and reduce greenhouse gas emissions.

The air district guidance states that: "…if approval of a project would not result in significant and unavoidable air quality impacts, after the application of all feasible mitigation, the project would be considered consistent with the Clean Air Plan." As indicated in the previous discussion, the project's operational emissions would not result in significant and unavoidable air quality impacts**.** While the project's construction-related emissions would be significant, Mitigation Measures M-AQ-1a, Tier 4 Engines for Selected Equipment, and M-AQ-1b, Bay Area Air Quality Management District Basic Construction Measures, would reduce construction impacts to a less-than-significant level (see Impact AQ-1).

[18] U.S. Forest Service, Technology and Development Program, Recreation Management Tech Tips, Vault Toilet Vent Gas Odor Control, September 2003. *https://www.fs.fed.us/eng/pubs/html/00231304/00231304.html.*

The air district guidance provides that a project should not disrupt or hinder implementation of control measures of the Clean Air Plan. Examples of a project that could cause the disruption or delay of Clean Air Plan control measures are projects that would preclude the extension of a transit line or bicycle path, or projects that propose excessive parking beyond city parking requirements. The project would maintain the existing character of the project site, which is an open space. It would not preclude the extension of a transit line or a bicycle path or any other transit improvement. Thus, the project would not disrupt or hinder implementation of control measures identified in the Clean Air Plan.

Because the project would not result in significant and unavoidable air quality impacts after implementation of Mitigation Measures M-AQ-1a and M-AQ-1b, does not propose excessive parking beyond city parking requirements, and would not hinder or disrupt implementation of Clean Air Plan control measures, based on air district guidance, the project is consistent with the applicable air quality plan.

Therefore, with implementation of Mitigation Measures M-AQ-1a and M-AQ-1b, this impact would be less than significant.

> *Mitigation Measures M-AQ-1a and M-AQ-1b apply to construction and operation of all project components, under the proposed access program and variants.*
>
> **Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.**
>
> (See Impact AQ-1, above, for a description of the mitigation measure.)
>
> **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**
>
> (See Impact AQ-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Construction and operation of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in potentially significant impacts related to consistency with the applicable air quality plan. Implementation of Mitigation Measure M-AQ-1a, Tier 4 Engines for Selected Equipment, and Mitigation Measure M-AQ-1b, Bay Area Air Quality Management District Basic Construction Measures, would reduce impacts from construction-related emissions of criteria air pollutants to less-than-significant levels. For the reasons presented, with implementation of recommended mitigation, construction and operation of the project with the proposed access program would not conflict with the Clean Air Plan. This impact would be less than significant.

Cumulative Impacts

Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions. (Less than Significant with Mitigation)

The contribution of a project's individual emissions to regional air quality impacts is, by its nature, a cumulative effect. Emissions from past, present, and probable projects in the region also have or will contribute to adverse regional air quality impacts on a cumulative basis. No single project by itself would be large enough to result in non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative air quality conditions. As described above, the project-level thresholds for criteria air pollutants are based on levels at which new sources are not anticipated to contribute to an air quality violation or result in a cumulatively considerable net increase in criteria air pollutants. Therefore, because the project's construction emissions, without mitigation, would exceed the project-level thresholds under the proposed access program and variants, the project would result in a considerable contribution to cumulative regional air quality impacts. However, as discussed above, implementation of Mitigation Measures M-AQ-1a and M-AQ-1b would reduce this impact to a less-than-significant level.

Additionally, as discussed in Impact AQ-4, operational emissions under the proposed access program and variants would be well below the significance thresholds that represent a cumulatively considerable contribution to air quality. Therefore, operational emissions combined with other cumulative projects would not result in a significant cumulative impact.

> *Mitigation Measures M-AQ-1a and M-AQ-1b apply to construction of all project components, under the proposed access program and variants.*
>
> **Mitigation Measure M-AQ-1a – Tier 4 Engines for Selected Equipment.**
>
> (See Impact AQ-1, above, for a description of the mitigation measure.)
>
> **Mitigation Measure M-AQ-1b – Bay Area Air Quality Management District Basic Construction Measures.**
>
> (See Impact AQ-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in cumulatively considerable impacts related to emissions of construction-related criteria air pollutants and fugitive dust. Implementation of Mitigation Measure M-AQ-1a, Tier 4 Engines for Selected Equipment and Mitigation Measure M-AQ-1b, Bay Area Air Quality Management District Basic Construction Measures, would reduce impacts from construction-related emissions of criteria air pollutants to a less-than-significant level.

4.7 Greenhouse Gas Emissions

This section describes the existing greenhouse gas (GHG) emissions in the project area and identifies the potential GHG emissions that could result from implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project under the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). This section presents a quantitative evaluation of construction- and operations-related GHG emissions and assesses potential impacts using the Bay Area Air Quality Management District guidelines. This analysis also qualitatively assesses the project's consistency with local and statewide GHG reduction plans and policies.

During public scoping, no comments were received on the topic of greenhouse gas emissions, but one comment was received on the related topic of climate change, and the effects of this project on climate change. This Environmental Impact Report (EIR) considers the project's cumulative contribution to GHG emissions and global climate change in Section 4.7.3, Impacts and Mitigation Measures.

The Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR) was published prior to adoption of Assembly Bill 32, the California Global Warming Solutions Act of 2006, which requires EIRs to evaluate project-generated GHGs. Because the management plan EIR does not address potential GHG impacts, this section does not rely upon or incorporate by reference information from that document related to GHG emissions.

4.7.1 Environmental Setting

4.7.1.1 Greenhouse Gases and Climate Change

Gases that trap heat in the atmosphere are referred to as *greenhouse gases* (listed below) because they capture heat radiated from the sun as it is reflected back into the atmosphere—much like a greenhouse. The accumulation of GHGs contributes to global climate change. The primary GHGs, or climate pollutants, are *carbon dioxide* (CO_2), *black carbon*,[1] *methane* (CH_4), *nitrous oxide* (N_2O), *ozone*, and water vapor.

Individual projects contribute to the cumulative effects of climate change by emitting GHGs during the demolition, construction, and operational phases. While some of the primary GHGs occur naturally in the atmosphere, human activities also cause emissions of CO_2, CH_4, and N_2O, accelerating the rate at which these compounds collect in the earth's atmosphere. CO_2 is largely a byproduct of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Black carbon has emerged as a major contributor to global climate change, possibly second only to CO_2. Black carbon is produced naturally and by human

[1] Black carbon is the sooty black material emitted from gas and diesel engines, coal-fired power plants, and other sources that burn fossil fuel. It constitutes a significant portion of particulate matter, which is an air pollutant.

activities as a result of the incomplete combustion of fossil fuels, biofuels, and biomass.[2] N_2O is a byproduct of various industrial processes. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, which are generated in certain industrial processes. GHGs are typically reported in "*carbon dioxide equivalent*" measures (CO_2e).[3]

There is international scientific consensus that human-caused increases in GHGs contribute to global warming and thus to climate change. Many impacts from climate change—including sea level rise and increased fires, floods, severe storms, and heat waves—are already occurring and will only become more severe and costly.[4] Secondary effects of climate change likely include impacts on agriculture, the electricity system, and native freshwater fish ecosystems; increased vulnerability of levees; changes in disease vectors; and alterations in habitat and biodiversity.[5,6]

4.7.1.2 Greenhouse Gas Emission Estimates and Energy Providers in California

The California Air Resources Board estimated that in 2010 California produced about 451.6 million gross metric tons of CO_2e (million MT CO_2e).[7] The air board found that transportation is the source of 38 percent of the state's GHG emissions, followed by electricity generation (both in-state generation and imported electricity) at 21 percent and industrial sources at 19 percent. Commercial and residential fuel use (primarily for heating) accounted for 10 percent of GHG emissions.[8] In unincorporated San Mateo County, motorized transportation and commercial and industrial energy sectors were the two largest sources of GHG emissions, accounting for approximately 61 percent (479,400 MT CO_2e) and 21 percent (160,900 MT CO_2e), respectively, of the unincorporated county's emissions of 782,080 MT CO_2e in 2005.[9] Residential energy consumption accounts for approximately 12 percent (93,100 MT CO_2e) of the unincorporated county's GHG emissions.[10]

2 Center for Climate and Energy Solutions, *What is Black Carbon?* April 2010. *http://www.c2es.org/ document/what-is-black-carbon/*.

3 Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

4 Intergovernmental Panel on Climate Change, *Climate Change 2013: The Physical Science Basis, Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, 2013. *http://www.climatechange2013.org/images/report/WG1AR5_ALL_FINAL.pdf*.

5 Ibid.

6 California Climate Change Center. *Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California,* July 2012. *http://www.energy.ca.gov/2012publications/CEC-500-2012-007/CEC-500-2012-007.pdf*.

7 California Air Resources Board, California Greenhouse Gas Inventory for 2000-2015 – by Category as Defined in the 2008 Scoping Plan. *https://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_sum_2000-15.pdf*, updated June 6, 2017.

8 Ibid.

9 San Mateo County, *Energy Efficiency Climate Action Plan*. June 2013. *http://www.smcsustainability.org/download/climate-change/Energy-Efficiency-Climate-Action-Plan.pdf*.

10 Ibid.

Pacific Gas and Electric Company (PG&E) is the primary electricity provider in San Mateo County. In 2009,[11] electricity consumption in the unincorporated portions of the county was approximately 251,887 megawatt-hours.[12]

PG&E's 2016 power mix was as follows: 17 percent natural gas, 24 percent nuclear, 33 percent eligible renewables (described below), 12 percent large hydroelectric, and 14 percent unspecified power.[13]

4.7.2 Regulatory Framework

This section describes the regulatory framework as it pertains to GHGs.

4.7.2.1 Federal Regulations

There are no federal regulations or requirements pertaining to GHG emissions that would apply to the project.

4.7.2.2 State Regulations

Executive Orders S-3-05 and B-30-15

Executive Order S-3-05[14] sets forth a series of target dates by which statewide emissions of GHGs must be progressively reduced, as follows: by 2010, reduce GHG emissions to 2000 levels (approximately 457 million MT CO_2e); by 2020, reduce emissions to 1990 levels (approximately 427 million MT CO_2e); and by 2050, reduce emissions to 80 percent below 1990 levels (approximately 85 million MT CO_2e). As discussed in Section 4.7.1, Environmental Setting, California produced about 452 million MT CO_2e in 2010, thereby meeting the 2010 target date to reduce GHG emissions to 2000 levels.

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

Assembly Bill 32 and California Climate Change Scoping Plan

In 2006, the California legislature passed Assembly Bill 32 (California Health and Safety Code Division 25.5, sections 38500 et seq.), also known as the California Global Warming Solutions Act.

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11 This is the most recent year for which data are available, as published in County's Energy Efficiency Climate Action Plan; and represents the 2005 base year.

12 Ibid.

13 PG&E, Delivering Low-Emission Energy. *https://www.pge.com/en_US/about-pge/environment/what-we-are-doing/clean-energy-solutions/clean-energy-solutions.page?WT.mc_id=Vanity_cleanenergy*, accessed June 26, 2018.

14 Office of the Governor, *Executive Order S-3-05*, June 1, 2005. *http://static1.squarespace.com/static/549885d4e4b0ba0bff5dc695/t/54d7f1e0e4b0f0798cee3010/1423438304744/California+Executive+Order+S-3-05+(June+2005).pdf*.

15 Office of the Governor, *Executive Order B-30-15*, April 29, 2015. *https://www.gov.ca.gov/news.php?id=18938*.

Assembly Bill 32 requires the California Air Resources Board to design and implement emission limits, regulations, and feasible and cost-effective measures to reduce statewide GHG emissions to 1990 levels by 2020.

Pursuant to Assembly Bill 32, the air board adopted the Climate Change Scoping Plan in December 2008. The scoping plan outlines measures to meet the 2020 GHG reduction limits, which will require California to reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels (approximately 15 percent below 2008 levels).[16] The plan estimates a reduction of 174 million MT CO_2e from transportation, energy, agriculture, forestry, and other high GHG-emitting sectors (see Table 4.7-1).[17]

TABLE 4.7-1
GHG REDUCTIONS FROM THE ASSEMBLY BILL 32 SCOPING PLAN CATEGORIES[18,19]

Scoping Plan Category	GHG Reduction (Million Metric Tons CO_2e)
Transportation Sector	62.3
Electricity and Natural Gas	49.7
Industry	1.4
Landfill Methane Control Measure (Discrete Early Action)	1
Forestry	5
High Climate-Change-Potential GHGs	20.2
Additional Reductions Needed to Achieve the GHG Cap	34.4
Other Recommended Measures	
Government Operations	1 to 2
Agriculture – Methane Capture at Large Dairies	1
Water	4.8
Green Buildings	26
High Recycling / Zero Waste Commercial Recycling	
Composting	9
Anaerobic Digestion Extended Producer Responsibility Environmentally Preferable Purchasing	
Total Reductions Counted Towards 2020 Target	**216.8 to 217.8**

SOURCE: California Air Resources Board, 2008.

The Assembly Bill 32 scoping plan also anticipates that actions by local governments will reduce GHG emissions, because local governments have the primary authority to plan, zone, approve,

16 California Air Resources Board, *California's Climate Plan: Fact Sheet*. *http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf*, updated January 27, 2010.
17 Ibid.
18 California Air Resources Board, *Climate Change Scoping Plan*, December 2008. *http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf*.
19 California Air Resources Board, *California's Climate Plan: Fact Sheet*. *http://www.arb.ca.gov/cc/facts/scoping_plan_fs.pdf*, updated January 27, 2010.

and permit development to accommodate population growth and the changing needs of their jurisdictions.[20] The scoping plan also relies on the requirements of Senate Bill 375 (discussed below) to align local land use and transportation planning to achieve GHG reductions.

The scoping plan must be updated every five years to evaluate Assembly Bill 32 policies and ensure that California is on track to achieve the 2020 GHG reduction goal. In 2014, the air board released the First Update to the Climate Change Scoping Plan, which builds upon the initial scoping plan with new strategies and recommendations. The first update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low-carbon investments. This update defines the air board's climate change priorities for the next five years and sets the groundwork to reach long-term goals set forth in Executive Order S-3-05. The first update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals in the initial scoping plan. It also evaluates how to align the state's longer-term GHG reduction strategies with other state policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[21]

2017 Scoping Plan Update

On December 14, 2017, the air board approved the final version of California's 2017 Climate Change Scoping Plan, which outlines the proposed framework of action for achieving the 2030 GHG target of 40 percent reduction in GHG emissions relative to 1990 levels.[22] The 2017 scoping plan update identifies key sectors targeted for GHG reduction as part of the implementation strategy, which calls for improvements to low-carbon energy generation, industry processes, transportation sustainability, as well as management of natural and working lands, waste management, and water and wastewater processing. Through a combination of data synthesis and modeling, the air board identified a target statewide 2030 emissions limit of 260 million MT CO2, indicating that further commitments will be necessary to achieve an additional reduction of 50 million MT CO_2e beyond that attainable through current policies and programs. The cornerstone of the 2017 scoping plan update is an expansion of the cap-and-trade program to meet the aggressive 2030 GHG emissions goal and ensure achievement of the 2050 limit set forth by Executive Order B-30-15.

The 2017 scoping plan update's strategy for meeting the 2030 GHG target incorporates the full range of legislative actions and state-developed plans that have relevance to the year 2030. These include:

- Low Carbon Fuel Standard, which is now extended beyond 2020 and increases the carbon intensity reduction requirement to 18 percent by 2030
- Senate Bill 350, which increases the renewables portfolio standard to 50 percent and requires a doubling of energy efficiency for existing buildings by 2030

20 California Air Resources Board, *Climate Change Scoping Plan*, December 2008. *http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf*.

21 California Air Resources Board, *First Update to the Climate Change Scoping Plan*, May 2014. *http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf*.

22 California Air Resources Board, *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*, November, 2017, *https://www.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf*; accessed December 18, 2017.

- The 2016 Mobile Source Strategy, which is estimated to reduce emissions from mobile sources, including an 80 percent reduction in smog-forming emissions and a 45 percent reduction in diesel particulate matter from 2016 levels in the South Coast Air Basin, a 45 percent reduction in GHG emissions, and a 50 percent reduction in the consumption of petroleum-based fuels
- The Sustainable Freight Action Plan, which identifies strategies to improve freight efficiency and transition to zero-emission freight handling technologies (described in more detail below)
- Senate Bill 1383, which requires a 50 percent reduction in human-caused black carbon and a 40 percent reduction in hydrofluorocarbon and methane emissions below 2013 levels by 2030
- Assembly Bill 398, which extends the state cap-and-trade program through 2030

With respect to project-level GHG reduction actions and thresholds for individual development projects, the 2017 scoping plan update indicates:

> Beyond plan-level goals and actions, local governments can also support climate action when considering discretionary approvals and entitlements of individual projects through CEQA. Absent conformity with an adequate geographically-specific GHG reduction plan as described in the preceding section above, the California Air Resources Board recommends that projects incorporate design features and GHG reduction measures, to the degree feasible, to minimize GHG emissions. Achieving no net additional increase in GHG emissions, resulting in no contribution to GHG impacts, is an appropriate overall objective for new development.[23]

Senate Bill 375

The scoping plan also relies on the requirements of Senate Bill 375 (chapter 728, statutes of 2008), also known as the Sustainable Communities and Climate Protection Act of 2008, to garner GHG reductions from more efficient land use patterns and improved transportation systems. Senate Bill 375 requires regional transportation plans developed by the state's 18 metropolitan planning organizations to incorporate a "sustainable communities strategy" designed for the purpose of achieving GHG emission reduction targets set by the air board. For the Bay Area, the per-capita GHG emission reduction target is a 7 percent reduction by 2020 and a 15 percent reduction by 2035 from 2005 levels.[24] Plan Bay Area, the Metropolitan Transportation Commission's regional transportation plan, adopted in July 2013, is the region's first plan subject to Senate Bill 375 requirements.[25]

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23 California Air Resources Board, *California's 2017 Climate Change Scoping Plan: The strategy for achieving California's 2030 greenhouse gas target*, November, 2017, accessed December 18, 2017 Page 101.

24 California Air Resources Board, *Executive Order No. G-11-024, Relating to Adoption of Regional Greenhouse Gas Emission Reduction Targets for Automobiles and Light Trucks Pursuant to Senate Bill 375,* February 2011. *http://www.arb.ca.gov/cc/sb375/executive_order_g11024.pdf*.

25 Association of Bay Area Governments and Metropolitan Transportation Commission, *Plan Bay Area*, adopted July 18, 2013. *http://files.mtc.ca.gov/pdf/Plan_Bay_Area_FINAL/Plan_Bay_Area.pdf*.

Senate Bills 1078, 107, X1-2, and 350 and Executive Order S-14-08 and S-21-09

California established aggressive renewable portfolio standards under Senate Bill 1078 (chapter 516, statutes of 2002) and Senate Bill 107 (chapter 464, statutes of 2006), which requires retail sellers of electricity to provide at least 20 percent of their electricity supply from renewable sources by 2010. Executive Order S-14-08 (November 2008) expanded the state's renewable portfolio standard from 20 percent to 33 percent of electricity from renewable sources by 2020. In 2009, Governor Schwarzenegger continued California's commitment to the renewable portfolio standard by signing Executive Order S-21-09, which directed the air board to enact regulations to help California meet the renewable portfolio standard goal of 33 percent renewable energy by 2020.[26]

In April 2011, Governor Brown signed Senate Bill X1-2 (chapter 1, statutes of 2011) codifying the GHG reduction goal of 33 percent by 2020 for energy suppliers. This renewable portfolio standard preempts the air board's electricity standard of 33 percent from renewable sources and applies it to all electricity suppliers (not just retail sellers) in the state, including publicly owned utilities, investor-owned utilities, electricity service providers, and community choice aggregators. Under Senate Bill X1-2, all of these entities must adopt the new renewable portfolio standard goals of 20 percent of retail sales from renewable sources by the end of 2013, 25 percent by the end of 2016, and 33 percent by the end of 2020.[27] Eligible renewable sources include geothermal, ocean wave, solar photovoltaic, and wind but exclude large hydroelectric (30 megawatts or more). Therefore, because the SFPUC receives more than 67 percent of its electricity from large hydroelectric facilities, the remaining electricity the SFPUC provides must be 100 percent renewable.[28] Senate Bill 350 (chapter 547, statutes of 2015), signed by Governor Brown in October 2015, dramatically increased the stringency of the renewable portfolio standard. Senate Bill 350 establishes a renewable portfolio standard target of 50 percent by 2030, along with interim targets of 40 percent by 2024 and 45 percent by 2027.

Senate Bill 97 – Update to the CEQA Guidelines

Senate Bill 97 required the Governor's Office of Planning and Research to amend the CEQA Guidelines to address the feasible mitigation of GHG emissions or the effects of GHGs. In response, the office amended the CEQA Guidelines by adding section 15183.5 to provide guidance for analyzing GHG emissions, along with other amendments to the CEQA Guidelines, including adding a new section to the CEQA checklist (CEQA Guidelines Appendix G) to address questions regarding a project's potential to emit GHGs.

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26 Office of the Governor, *Executive Order S-21-09*, September 15, 2009. *http://www.climatestrategies.us/library/library/view/290.*

27 Ibid.

28 San Francisco Public Utilities Commission, *Approval of the Enforcement Program for the California Renewable Energy Resources Act*, December 13, 2011. *https://infrastructure.sfwater.org/fds/fds.aspx?lib=SFPUC&doc=741114&data=285328890.*

4.7.2.3 Local Regulations

Bay Area Air Quality Management District

The Bay Area Air Quality Management District is responsible for attaining and maintaining federal and state air quality standards in the San Francisco Bay Area Air Basin, as established by the federal Clean Air Act and the California Clean Air Act, respectively. The federal and state Clean Air Acts require plans to be developed for areas that do not meet air quality standards. The most recent air quality plan, the Bay Area 2017 Clean Air Plan, includes a goal of reducing GHG emissions to 1990 levels by 2020, to 40 percent below 1990 levels by 2035, and to 80 percent below 1990 levels by 2050.[29]

In addition, the air district established a basin-wide inter-agency climate protection program to reduce pollutants that contribute to global climate change and affect air quality in the air basin. The program includes GHG-reduction measures that promote energy efficiency, reduce region-wide vehicle miles traveled, and promote development of alternative energy sources.[30]

The air district developed thresholds of significance along with methods for evaluating compliance, which are presented in its guidance document entitled the California Environmental Quality Act Air Quality Guidelines.[31] These guidelines assist lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts on air quality.

With respect to project operations, the air district's guidelines establish three potential analysis criteria for land use development projects:

- Compliance with a qualified climate action plan, with a goal consistent with Assembly Bill 32
- A mass emissions threshold of 1,100 MT of CO_2e per year
- A GHG efficiency threshold of 4.6 MT of CO_2e per service population (project jobs plus project residents)

The air district thresholds are based on the Assembly Bill 32 GHG reduction goals and a *gap analysis*[32] that attributes an appropriate share of GHG emissions reductions to new land use development projects under the air district's jurisdiction.

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29 Bay Area Air Quality Management District, Draft 2017 Clean Air Plan, Spare the Air, Cool the Climate, 2017. *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/baaqmd_2017_cap_draft_122816-pdf.pdf?utm_campaign=CAP+2017+Draft&utm_medium=email&utm_content=article3_link1.* Accessed on January 13, 2017.

30 Bay Area Air Quality Management District, *Climate Protection Strategy*, April 2015. *http://www.baaqmd.gov/~/media/files/planning-and-research/plans/clean-air-plan-update/rcsp-flyer-2-pdf.pdf?la=en.*

31 Bay Area Air Quality Management District, *California Environmental Quality Act Air Quality Guidelines. http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en.* May 2017.

32 A gap analysis examines all sources of GHG emissions, the effect of current regulations and programs, the feasibility of project-specific mitigation, and then allocates an overall budget of emissions reductions allocated to the land use sector and subject to CEQA.

San Mateo County

The project would be located within an unincorporated area of San Mateo County. The County has two applicable climate action plans—the Government Operations Climate Action Plan[33] and the Energy Efficiency Climate Action Plan.[34] The government operations plan identifies how the County will meet established reduction targets by 2020 and 2050, as required by Assembly Bill 32. To achieve these GHG reduction targets, the government operations plan outlines GHG reduction measures in the areas of energy, transportation, and solid waste. Of the nine GHG measures identified in the operations plan, none are relevant to the project.

The County's energy efficiency plan establishes a target of 17 percent below 2005 GHG emission levels by 2020. To meet this target, the energy efficiency plan identifies GHG emission reduction measures in the areas of residential energy efficiency, commercial energy efficiency, green building ordinance, renewable energy, transportation, alternative fuels, waste diversion, water efficiency, sustainable agriculture practices, off-road technology, and *sequestration*.[35]

4.7.3 Impacts and Mitigation Measures

4.7.3.1 Significance Criteria

The project would have a significant impact related to GHG emissions if it were to:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHGs.

4.7.3.2 Approach to Analysis

GHG emissions and global climate change represent cumulative impacts. GHG emissions cumulatively contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to noticeably change the average global temperature; rather, the combination of GHG emissions from past, present, and future projects and activities have contributed and will continue to contribute to global climate change and its associated environmental impacts.

Because no individual project could emit GHGs at a level that could result in a significant impact on the global climate, the impact analysis that follows focuses on the project's contribution to cumulatively significant GHG emissions. Accordingly, this section does not include an individual project-specific impact statement. The air district has prepared guidelines and methodologies for analyzing GHG emissions, which are consistent with CEQA Guidelines sections 15064.4 and

[33] San Mateo County, *Government Operations Climate Action Plan. http://www.smcsustainability.org/download/climate-change/Government-Ops-Climate-Action-Plan.pdf*. September 2012.
[34] San Mateo County, *Energy Efficiency Climate Action Plan. https://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/SanMateoCounty_EECAP_FINAL_06-04-2013.pdf*. June 2013.
[35] Carbon sequestration is the long-term storage of carbon in plants, soils, geologic formations, and the ocean.

15183.5. These sections of the CEQA Guidelines describe how lead agencies are to analyze potential impacts from a project's GHG emissions and determine the significance of these impacts. CEQA Guidelines section 15064.4 allows lead agencies to rely on a quantitative or qualitative analysis to assess GHG emissions resulting from a project. The air district developed a quantitative "bright-line" screening threshold of 1,100 metric tons of CO_2e per year based on substantial evidence, as presented in its 2009 Revised Draft Options and Justification Report for California Environmental Quality Act Thresholds of Significance[36] as well as its 2017 CEQA air quality guidelines. If a project would exceed this threshold, the lead agency—consistent with these air district guidelines—may determine that the project would result in a cumulatively considerable contribution of GHG emissions and thus a cumulatively significant impact on climate change, thereby requiring mitigation.

The analysis in the Revised Draft Options and Justification Report determined that "…building each individual project in accordance with the proposed thresholds will achieve that individual project's respective portion of the emission reductions needed to implement the Assembly Bill 32 solution." Thus, a project with GHG emissions below 1,100 metric tons of CO_2e per year would not result in a cumulatively considerable contribution to climate change and would not conflict with Assembly Bill 32, and the impact would not be significant.

Construction Emissions Analysis

This analysis is based on estimates of GHG emissions from project construction derived using the CalEEMod emissions estimator model (version 2016.3.2); as input to the model, the SFPUC provided data on construction equipment fleet and activity for the proposed access program and variants (see Table 2-1 in Chapter 2, Project Description). Project construction activities would occur over approximately 12 months (between summer 2020 and summer 2021). The resulting exhaust emissions from off-road equipment, on-road trucking, and construction worker commute traffic during this period would contribute minimally to long-term regional GHG emissions.

Operations Emissions Analysis

Emissions from project visitor vehicles represent the greatest portion of the project's operational and total GHG emissions. The number of motor vehicle trips would vary by access program based on level of access restriction. As described in Section 4.6, Air Quality (Impact AQ-4), a docent-led access program would generate the fewest trips and therefore would result in the lowest emissions. In contrast, an unrestricted/unsupervised access program would generate the most trips, and therefore would result in the highest emissions. Therefore, this EIR presents a quantified analysis for the access program configurations that could generate the smallest and largest number of trips, representing the range of GHG emissions (i.e., lowest and highest) that could result from the project, and presents a qualitative analysis for the access program options that

[36] Bay Area Air Quality Management District, *Revised Draft Options and Justification Report – California Environmental Quality Act Thresholds of Significance*. *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en*. October 2009.

would result in greater visitation than under a docent program but lesser visitation than under an unsupervised/unrestricted access program.

Because the air district did not identify a GHG emission threshold specific to construction activity, this evaluation amortizes construction emissions over the assumed lifetime of the project and adds them to operational emissions for comparison to GHG thresholds. While most land use projects do not have a defined lifespan, industry practice is to conservatively assume a 30-year lifespan.

4.7.3.3 Impact Summary

Table 4.7-2 summarizes the impacts of the project related to GHG emissions. The impact summary table provides separate significance determinations for the proposed access program, access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access).

TABLE 4.7-2
SUMMARY OF IMPACTS – GREENHOUSE GASES

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact C-GG-1: Project construction and operation would not generate GHG emissions that could have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required

4.7.3.4 Impact Analysis

Cumulative Impacts and Mitigation Measures

Impact C-GG-1: Project construction and operation would not generate GHG emissions that could have a significant impact on the environment, or conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (Less than Significant)

The project would generate GHG emissions during construction and operations. Construction emissions would be limited to the 12-month construction period, while operational emissions would occur throughout the year following the completion of construction. Operational emissions represent the greatest portion of the project's GHG emissions, and visitor motor vehicle trips represent the greatest portion of operational emissions. Project visitation would vary by access program based on level of access restriction. As explained in Section 2.7.1, Trail Access Management Program and Visitation, a docent-led access program would result in the fewest

number of visitors (see Section 2.7.1.2, *Access Program Variant 1 [Docent Program]*), whereas an unsupervised and unrestricted access program would result in the greatest number of visitors (see Section 2.7.1.3, *Access Program Variant 2 [Unsupervised/Unrestricted Access]*). Accordingly, a program with some restrictions, such as the proposed access program (docent-led access along Fifield-Cahill ridge trail; unsupervised/restricted access along southern skyline ridge trail) would result in emissions similar to but slightly lower than the variant providing for unsupervised/unrestricted access.

As explained below, GHG emissions would not be substantial under any access configuration. Therefore, this section presents a quantitative analysis of the access program that could result in the lowest and highest potential GHG emissions (docent-led and unsupervised/unrestricted, respectively). This approach bookends the range of potential emissions across all access configurations, including the proposed access program.

Table 4.7-3 presents the project's estimated construction- and operations-related GHG emissions. As shown in the table, construction activities associated with a docent-led access program would generate estimated annual GHG emissions of up to 64 metric tons of CO_2e. Once the project is open to the public, docent-led access would provide for a maximum of 12,480 visitors per year to each project trail (i.e., Fifield-Cahill and southern skyline ridge trails), for a total of 24,960 visitors per year (see Section 2.7.1.2, *Access Program Variant 1 [Docent Program]*). This analysis assumes each visit would generate one trip to the parking areas and one trip home and, based on visitor surveys for the Fifield-Cahill ridge trail under the existing docent program,[37] that each trip would have an average trip length of 18.9 miles, which is equivalent to 49,920 one-way trips per year. As shown in the table, operations activities associated with the docent-led access program would generate estimated annual GHG emissions of up to 344 metric tons of CO_2e. Total GHG emissions under a docent-led access program would be 408 metric tons of CO_2e, which is below the 1,100 metric tons of CO_2e significance threshold.

As also shown in Table 4.7-3, construction activities associated with an unsupervised/unrestricted access program would generate estimated annual GHG emissions of 67 metric tons of CO_2e. Once the project is open to the public, unsupervised/unrestricted access could attract up to approximately 50,020 visitors per year (i.e., Fifield-Cahill and southern skyline ridge trails; see Section 2.7.1.3, *Access Program Variant 2 [Unsupervised/Unrestricted Access]*). It is assumed that each visit would generate one trip to the parking areas and one trip home. Based on surveys of prospective visitors performed to estimate visitation without supervision or restriction,[38] each trip would have an average trip length of 12 miles, which is equivalent to 100,040 one-way trips per year. The same assumptions regarding trip lengths and vehicle types were used in the emissions estimates for docent-led access. As shown in the table, operational activities under an unsupervised/unrestricted access program would generate estimated annual GHG emissions of up to 441 metric tons of CO_2e.

[37] CHS Consulting Group, *Travel Demand and VMT Estimates for Southern Skyline Boulevard Ridge Trail Extension*, March 22, 2018. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

[38] Ibid.

Total GHG emissions under an unsupervised/unrestricted access program would be 508 metric tons of CO_2e, which is below the 1,100 metric tons of CO_2e significance threshold.

TABLE 4.7-3
ESTIMATED ANNUAL PROJECT GHG EMISSIONS

Project GHG Construction-Related Emissions (Amortized)	Estimated Annual Emissions (metric tons per year) CO_2e
Docent-Led Access	
Construction Emissions	64
Operations Emissions	344
Total Emissions	408
Significance Threshold	1,100
Threshold Exceeded?	No
Unrestricted/Unsupervised Access	
Construction Emissions	67
Operations Emissions	441
Total Emissions	508
Significance Threshold	1,100
Threshold Exceeded?	No

SOURCE: See Appendix B of this EIR.

As explained above and represented in Table 4.7-3, estimated annual GHG emissions for the access configurations with the lowest and highest potential emissions (which correspond to access program variant 1 and variant 2, respectively) would be lower than the significance thresholds. Therefore, estimated annual GHG emissions under the project, regardless of which access program were selected (i.e., the proposed access program or variants 1 through 3), would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Operation of the project with the proposed access program along the Fifield-Cahill and southern skyline ridge trails would result in less-than-significant impacts related to operational emissions of GHGs. Mitigation is not required.

GHG Plans and Policies Consistency

As noted previously, because the project consists of specialized recreation infrastructure facilities with unique operational characteristics, and since the project is located outside the boundaries of San Francisco, the project is not subject to most of the recommendations and requirements of the City and County of San Francisco's Strategies to Address Greenhouse Gas Emissions, many of which apply to structures developed for human occupancy and/or to activities that occur within San Francisco's boundaries (e.g., Clean Construction Ordinance). However, the latest version of

these strategies cites the SFPUC's Watershed and Environmental Improvement Program, which includes trail building, as an implementation action.[39]

The 2008 Green Building Ordinance requires that all City departments prepare an annual department-specific climate action plan. In 2009, the SFPUC completed a climate action plan focused on energy efficiency and renewable energy programs to reduce GHG emissions. In accordance with the SFPUC's latest available Departmental Climate Action Report for fiscal year 2012/2013,[40] the SFPUC has implemented an aggressive alternative fuel program, installed numerous charging stations for electric vehicles, and completed various energy efficiency and solar generation projects.

The air district developed the "bright-line" threshold of 1,100 metric tons of CO_2e per year to achieve an aggregate emissions reduction of 1.6 million metric tons CO_2e by 2020 as well as to ensure the air basin contributed its fair share of GHG emission reductions from new land use projects to meet the GHG reduction goals of Assembly Bill 32 and the scoping plan (i.e., 1990 GHG emissions levels by 2020).[41] Consequently, the project would be consistent with the GHG reduction goals of Assembly Bill 32. Therefore, implementation of the project would not conflict with applicable plans, policies, or regulations adopted for the purpose of reducing GHG emissions, and this impact would be less than significant.

Mitigation: None required.

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39 City and County of San Francisco, *2017 Greenhouse Gas Reduction Strategy Update*, July 2017, p. 148. *http://sfmea.sfplanning.org/GHG/GHG_Strategy_October2017.pdf.*

40 San Francisco Public Utilities Commission, 2014. *Departmental Climate Action: Annual Report for Fiscal Year 2012-13*. March 18, 2014. *http://sfwater.org/modules/showdocument.aspx?documentid=4138.*

41 Bay Area Air Quality Management District, *Revised Draft Options and Justification Report – California Environmental Quality Act Thresholds of Significance*, October 2009. *http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/revised-draft-ceqa-thresholds-justification-report-oct-2009.pdf?la=en*.

4.8 Biological Resources

4.8.1 Introduction

This section describes the existing biological resources environment in the project area and identifies the potential for impacts on sensitive biological resources with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). This analysis addresses potential effects from construction and operation of the proposed trail facilities and implementation of the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). Topics addressed in this section include: special-status plants and animal species, sensitive natural communities, including wetlands and wildlife movement corridors, and invasive plants and plant pathogens. Appendix C provides supporting technical information on biological resources.

Of the comments received during the public scoping period, comments about biological resources generally concern the following: baseline habitat assessments for special-status species in the project area; direct, indirect, and cumulative impacts of the project on wildlife and habitat; the timing of surveys for special-status species; consultation with the California Department of Fish and Wildlife on mitigation measures designed to avoid and/or minimize impacts on special-status species; the "taking" of fully protected species and California Endangered Species Act permits; impacts of unsupervised access on the spread of invasive species and sudden oak death; and impacts of fencing and retaining walls on wildlife. Sections 4.8.2, Environmental Setting, 4.8.3, Regulatory Framework, and 4.8.4, Impacts and Mitigation Measures, consider these public comments. Section 4.11, Hazards and Hazardous Materials, presents a discussion of wildfire hazards.

4.8.2 Environmental Setting

4.8.2.1 Definitions

The following definitions are used throughout this biological resources section:

> ***Project area*** refers to the general area that would experience project-related temporary or permanent surface disturbance (i.e., direct impacts), tree removal, or potential operational impacts due to the project (see Figures 2-3a through 2-4). This area includes the existing and proposed segments of the Bay Area Ridge Trail within the Peninsula Watershed, generally consisting of the Fifield-Cahill ridge trail, extending from Portola Gate on Sweeney Ridge to State Route 92 (S.R. 92) and the Skyline Quarry; as well as the proposed southern skyline ridge trail, extending from the S.R. 92/Skyline Boulevard (S.R. 35) intersection to the southern boundary of the Peninsula Watershed adjoining the Phleger Estate.[1] The project area includes a 50-foot buffer on either side of the existing and proposed trail alignments and all proposed new facilities.
>
> ***Riparian*** refers to habitats and vegetation species closely associated with streams, rivers, and other watercourses.

[1] The Phleger Estate is the property of the Golden Gate National Recreation Area.

Habitat types are mapping units that describe distinctive biological resources in the project area; these mapping units are made up of one or more vegetation alliances (defined below), are unvegetated or managed areas with similar wildlife habitat characteristics, or are composed of a mosaic that is too fine-textured to detect in the mapping available for this analysis. The mapping units used in this biological resources section are consistent with nomenclature used in the Peninsula Watershed Management Plan.[2]

Special-status biological resources include special-status plants and animals (see definition below), sensitive natural communities (including riparian habitats), wetlands, and other waters of the United States and of the state, as defined by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the California Department of Fish and Wildlife, and the San Francisco Bay Regional Water Quality Control Board.

Sensitive natural community is a natural community that receives regulatory recognition from municipal, county, state, and/or federal entities, such as the California Department of Fish and Wildlife in its California Natural Diversity Database, because the community is unique in its constituents, restricted in distribution, supported by distinctive soil conditions, and/or considered locally rare. One criterion for a sensitive natural community is a database global rank of G1, G2, or G3 or a state rarity rank of S1, S2, or S3.[3,4,5]

Vegetation alliance is a classification of vegetation defined by one or more diagnostic plant species, usually the species contributing the most cover to the uppermost canopy layer.[6] Vegetation alliance is roughly equivalent to the term "habitat type" as used in this analysis for natural vegetation.

Special-status plant and animal species are defined as:

- Species listed under the Federal Endangered Species Act, California Endangered Species Act, California Fish and Game Code, or Native Plant Protection Act as endangered,

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2 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018.

3 Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, *A Manual of California Vegetation, Second Edition*, California Native Plant Society and California Department of Fish and Game, Sacramento, 2009. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

4 California Department of Fish and Wildlife, California Natural Diversity Database, *Rarefind 5 printout and geographic information system database for the Montara Mountain, San Mateo, Woodside, San Francisco South, Hunters Point, Redwood Point, Palo Alto, Half Moon Bay, San Gregorio, La Honda and Mindego Hill 7.5-minute topographic quadrangles*, accessed January 12, 2017.

5 California Department of Fish and Wildlife, Natural Diversity Database, *Special Animals List*, Periodic publication, August 2017, p. 67:
G1 = Critically Imperiled—At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2 = Imperiled—At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.
G3 = Vulnerable—At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
S1 = Critically Imperiled—Critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
S2 = Imperiled—Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
S3 = Vulnerable—Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state

6 Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, *A Manual of California Vegetation, Second Edition*, 2009.

threatened, or rare; candidates species or species proposed for listing; or species that are designated as rare or fully protected, listed in Tables 4.8.2 and 4.8.3.

- Locally rare species defined in the CEQA Guidelines, which may include species that are designated as sensitive, declining, rare, or locally endemic, or as having limited or restricted distribution by various federal, state, and local agencies, organizations, and watch lists. These includes plants designated as rank 1 and 2 by the California Native Plant Society[7] and species recognized by the California Department of Fish and Wildlife as species of special concern, as shown in Tables 4.8.2 and 4.8.3.

4.8.2.2 Information Sources and Survey Methodology

Literature Review

The EIR preparers reviewed the following information related to the project area and the plant and wildlife species that may occur there:

- U.S. Fish and Wildlife Service lists of federal endangered, threatened, proposed, and candidate species that may occur within the project area and vicinity[8]
- California Natural Diversity Database animal records for the Montara Mountain, San Mateo, and Woodside U.S. Geological Survey 7.5-minute quadrangles on which the project is located, as well as the eight adjacent quadrangles: San Francisco South, Hunters Point, Half Moon Bay, Redwood Point, Mindego Hill, Palo Alto, La Honda, and San Gregorio[9]
- California Natural Diversity Database plant records for the 11 U.S. Geological Survey 7.5-minute quadrangles,[10] as described above
- California Native Plant Society Electronic Inventory of Rare and Endangered Plants of California 11-quadrangle search, as described above[11]
- Lower Crystal Springs Dam Improvements Project Final Environmental Impact Report (EIR)[12]
- SFPUC Peninsula Watershed Management Plan[13]
- SFPUC Peninsula Watershed Management Plan Final EIR (management plan EIR)[14]

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7 California Native Plant Society, *Rare Plant Program, Inventory of Rare and Endangered Plants* (online edition, v8-02). An 11-quad search was centered on the Montara Mountain, San Mateo, and Woodside 7.5-minute topographic quadrangles. This search also included plants listed as rank 3 and 4. California Native Plant Society, Sacramento, CA, *http://www.rareplants.cnps.org*, accessed January 13, 2017. The search also included San Francisco South, Hunters Point, Redwood Point, Palo Alto, Half Moon Bay, San Gregorio, La Honda, and Mindego Hill.

8 U.S. Fish and Wildlife Service, *Information for Planning and Conservation Resource List of Federal Endangered and Threatened Species that Occur in or may be Affected by the Southern Skyline Boulevard Ridge Trail Extension Project*, accessed January 12, 2017.

9 California Department of Fish and Wildlife, California Natural Diversity Database, accessed January 12, 2017.

10 Ibid.

11 California Native Plant Society, *Rare Plant Program*, *http://www.rareplants.cnps.org*, accessed January 13, 2017.

12 San Francisco Planning Department, *Final Environmental Impact Report, Lower Crystal Springs Dam Improvements Project*, Planning Department Case No. 2006.0536E, State Clearinghouse No. 2007012002, October 7, 2010.

13 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002.

14 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/Show Document.aspx?documentID=4343*, accessed May 18, 2018.

- Natural Environment Study for the Southern Skyline Boulevard Ridge Trail Extension Project[15]
- Biological Assessment, Southern Skyline Boulevard Ridge Trail Extension Project[16]
- SFPUC Geographic Information System mapping of special-status species and vegetation types for the Peninsula Watershed[17]

Field Surveys

The descriptions of habitat types and special-status biological resources presented in this section are largely based on reviews of project-specific information, and on mapping the SFPUC Natural Resources Division carried out and maintains in a geographic information system. A qualified biologist (employed by AECOM) prepared a Natural Environment Study and draft biological assessment for the southern skyline ridge trail. These studies evaluate the natural communities present along the southern trail alignment and the potential for special-status species. The Natural Environment Study identifies a wetland and a willow riparian area that may be subject to state and federal regulation (or "potentially jurisdictional wetlands and other waters") and a drainage along the trail alignment found not to be potentially jurisdictional. The AECOM reports and SFPUC vegetation mapping indicate the majority of the area is unmanaged native vegetation, including redwood, Douglas fir, mixed evergreen, and coastal scrub. Both reports found that the federally listed as threatened California red-legged frog (*Rana draytonii*) and the federally listed as endangered San Francisco garter snake (*Thamnophis sirtalis tetrataenia*) have a low potential to occur within the project area. The Natural Environment Study also notes the potential for other special-status species, but not federally listed wildlife species, to be present.

A reconnaissance field survey was also performed for this EIR. On behalf of the San Francisco Planning Department, an Orion Environmental Associates biologist and an Environmental Science Associates biologist carried out a site visit on April 5, 2017. The biologists observed the portion of the project area north of S.R. 92 (i.e., Portola Gate to Cemetery Gate and Skyline Quarry) from a vehicle, making frequent stops to verify observations of potential wetlands, plants, and animals. The biologists covered selected locations on foot, such as the sites of proposed facilities near Skylawn Memorial Park and Skyline Quarry. They observed the proposed southern skyline ridge trail alignment from a vehicle on S.R. 35, between the S.R. 92/S.R. 35 intersection and the southern terminus at the Phleger Estate, making frequent stops to observe vegetation and verify information in the Natural Environment Study and biological assessment.

A qualified biologist (employed by AECOM) performed focused biological resource surveys for the proposed southern skyline ridge trail construction footprint and for the site of the proposed 50-car parking lot and restroom along Fifield-Cahill ridge trail.[18] However, because SFPUC had

15 AECOM, *Draft Natural Environment Study*, July 2017.
16 AECOM, *Draft Biological Assessment, Bay Area Ridge Trail Improvements Project: Southern Skyline Boulevard Ridge Trail Extension*, prepared for San Francisco Public Utilities Commission, July 2017.
17 Schirokauer, D., T. Keeler-Wolf, J. Meinke, and P. van der Leeden, *Plant Community Classification and Mapping Project Final Report,* Point Reyes National Seashore, Golden Gate National Recreation Area, San Francisco Water Department Watershed Lands, Mount Tamalpais, Tomales Bay, and Samuel P. Taylor State Parks, December 2003.
18 AECOM, *Draft Natural Environment Study*, July 2017.

not yet specifically determined their proposed routes or locations, resource surveys were not carried out for the proposed fencing work areas beyond the footprints of the proposed southern skyline ridge trail or for the sites of the other proposed Fifield-Cahill ridge trail improvements (i.e., universal access loop trail and fencing alignment).

4.8.2.3 Overview of Project Assumptions and Setting

The project encompasses construction of a new 6-mile-long segment of multi-use trail (i.e., for pedestrians, equestrians, bicycles, and watershed maintenance vehicles) along S.R. 35, to be served by a new 20-car parking lot and two new restrooms. In addition, improvements along the existing Fifield-Cahill ridge trail would include construction of a 0.5-mile universal access loop trail (providing Americans with Disabilities Act-compliant access and parking), a new 50-car parking lot, and one new restroom. Both trail segments would include fencing (depending on the selected access management program) and other security mechanisms. Section 2.5, Project Components, of Chapter 2, Project Description, presents detailed descriptions of the project components and sites.

The project area is situated in the Santa Cruz Mountains, a portion of the Coast Ranges of San Mateo County, California. The project would be sited along northwest-southeast-trending ridgelines. The southern skyline ridge trail portion of the project area is situated on Kings Mountain—the highest ridgeline in this portion of the Coast Ranges. The Fifield-Cahill ridge trail is situated on Sweeney, Fifield, and Cahill ridges, east of the city of Pacifica, and west of the cities of San Bruno, Burlingame, and San Mateo. The project area elevation varies from about 1,200 feet at Portola Gate, nearly 1,400 feet on Fifield Ridge, 1,050 feet on Cahill Ridge, 871 feet at the S.R. 92/S.R. 35 intersection, 400 feet at Skyline Quarry, and 2,048 feet near the Phleger Estate. The ridges slope steeply to the east and west, forming sharply defined ridges and ravines. Soils in the project area are in two major groups: the Barnabe-Candlestick-Buriburi group and the Alambique-McGarvey group, both of which are addressed more fully in Section 4.9, Geology, Soils, and Paleontological Resources.

The project area has a mild climate that is greatly influenced by proximity to the coast. Most precipitation falls as rain during the winter months. The coastal ridges capture considerable rainfall from storms moving in from the ocean; while average annual precipitation in San Mateo County is 19 inches per year, precipitation along the ridgeline is typically double that, at 35 to 40 inches per year.[19] Marine air moving inland moderates summer temperatures and often brings fog. The average temperature in January is 50.5 degrees Fahrenheit (°F), and the average temperature in September is 65 °F.[20]

The SFPUC manages the 23,000-acre Peninsula Watershed with the primary objective of collecting, storing, and conveying drinking water to residents of San Francisco and other Bay Area communities. The management staff includes watershed keepers and biologists who monitor water quality and quantity in several reservoirs and conveyances; patrol the roads and

[19] U.S. Department of Agriculture, *Soil Conservation Service, Soil Survey of San Mateo County, Eastern Part, and San Francisco County*, California, 1991.

[20] Western Regional Climate Center, weather data, San Francisco Airport, *http://www.wrcc.dri.edu/summary/sfo.ca.html*, accessed April 4, 2017.

trails to ensure security and safety; and identify maintenance needs. Maintenance crews care for water infrastructure, roads, fences, and fuels. Natural resource specialists and their contractors monitor fuels, special-status species, and invasive species, and carry out a host of other ecological management tasks. These activities involve several full-time SFPUC staff and often one or more maintenance crews and associated vehicles and equipment working on the watershed each day. Public visitation is also a regular feature of watershed activity under the existing ridge trail usage program. About 1,000 visitors per year visit the Fifield-Cahill ridge trail under the docent program. These visitors are primarily hikers, but equestrian users and cyclists also visit the watershed, primarily along the Fifield-Cahill ridge trail.

One of the more active programs affecting vegetation and wildlife habitat on the Peninsula Watershed is the fire management program. The SFPUC has identified fuel management zones and fuelbreak units where vegetation is treated to manage risk. This activity is generally carried out along ridgelines and existing accessways to facilitate access to the watershed in the event of a large fire.

The setting described below includes the habitats, sensitive natural communities, and wetlands and other waters that project biologists observed or reported within the project area. The setting also describes the special-status species that were observed or that have the potential to be present in the project area based on the prevailing habitat types and their observed and reported habitat quality. Appendix C presents a more detailed inventory of potential species in the project area.

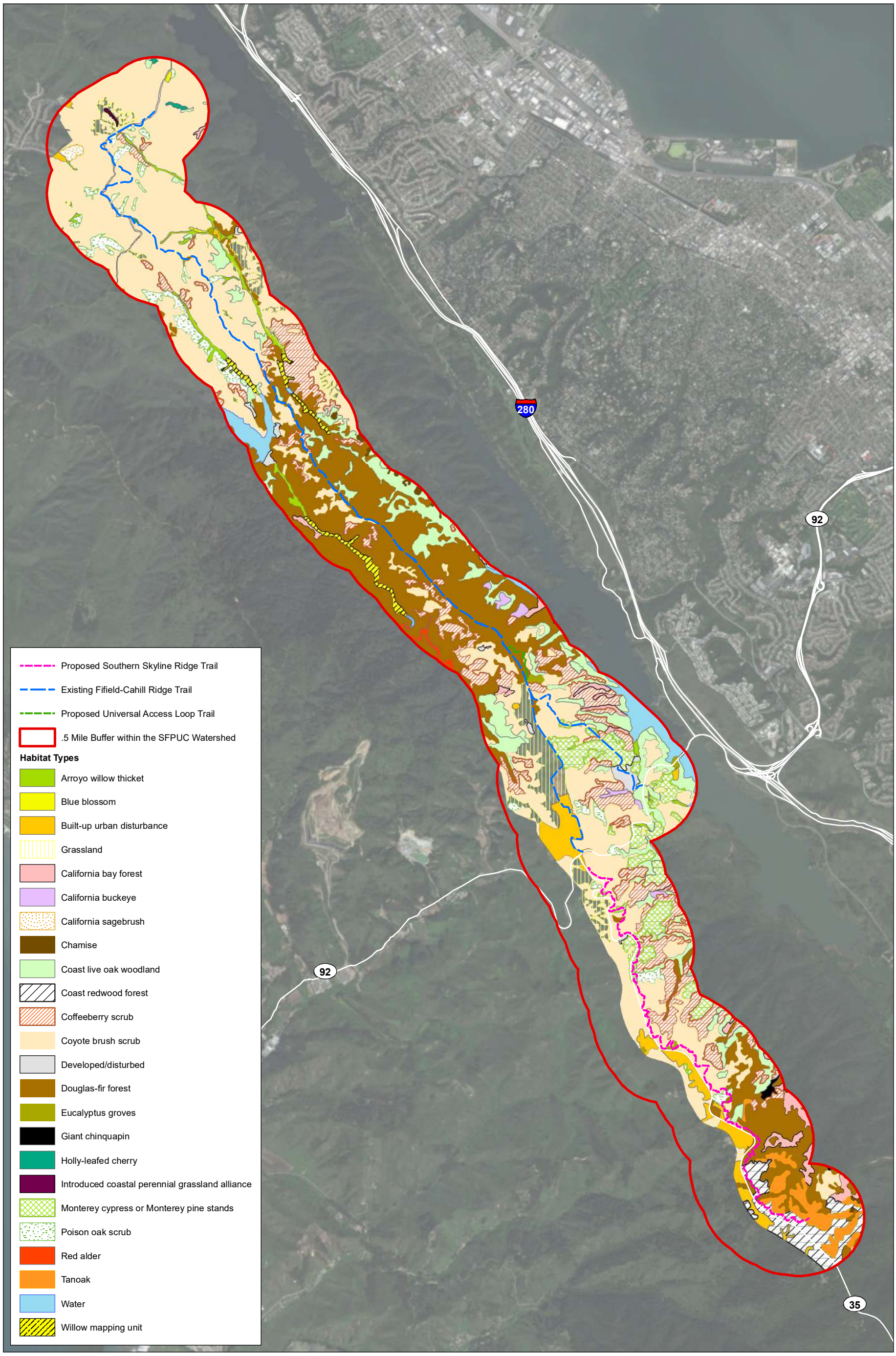
4.8.2.4 Vegetation and Habitat Types

SFPUC mapping as part of the Peninsula Watershed Management Plan implementation shows the project area supports grassland, herbaceous wetland, coyote brush scrub, coffeeberry scrub, poison-oak scrub, holly-leafed cherry chaparral, arroyo willow thicket, coast live oak woodland, Douglas fir forest, coast redwood forest, tanoak forest, eucalyptus groves, Monterey pine and Monterey cypress stands, and developed/disturbed habitats.[21] However, this analysis relies on the more recent Schirokauer et al. (2003)[22] mapping because it covers the full geographic extent of areas potentially affected by project construction and operation. Figure 4.8-1 shows the distribution of these habitat types within the project area. Table 4.8-1 presents the main project area habitat types addressed in this EIR, along with the corresponding terminology used in the management plan EIR, the corresponding terminology used in the Schirokauer et al. mapping, the equivalent vegetation alliances,[23] and the diversity database rarity rank. The following subsections describe

[21] SFPUC, Natural Resources Division, *Geographic Information System Map of Peninsula Watershed*, 2007. This mapping does not include fine-scale mapping units of herbaceous wetland and arroyo willow thickets within the project area, nor does it recognize very small areas of grassland within scrub mapping units. However, due to their proximity to the project and potential project impacts on sensitive natural communities, these communities are discussed in the setting and impact sections of this EIR.

[22] Schirokauer, D., T. Keeler-Wolf, J. Meinke, and P. van der Leeden, *Plant Community Classification and Mapping Project Final Report,* Point Reyes National Seashore, Golden Gate National Recreation Area, San Francisco Water Department Watershed Lands, Mount Tamalpais, Tomales Bay, and Samuel P. Taylor State Parks, December 2003.

[23] Sawyer, J.O., T. Keeler-Wolf, and J. Evens, *A Manual of California Vegetation* Second Edition, California Native Plant Society and California Department of Fish and Game, Sacramento, 2009.



SOURCE: SFPUC Vegetation GIS, 2017

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.8-1

Vegetation Types

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characteristic species, distribution and site conditions for each habitat type. Habitat descriptions are adapted from the management plan,[24] the Natural Environment Study,[25] and the Lower Crystal Springs Dam Improvements Project EIR.[26]

TABLE 4.8-1
NATURAL COMMUNITIES OF THE
SOUTHERN SKYLINE BOULEVARD RIDGE TRAIL EXTENSION PROJECT AREA

Habitat Type in Project Area	Habitats in the Management Plan EIR	Terminology in Schirokauer et al. (2003) Vegetation Mapping	Vegetation Alliance, and CNDDB Natural Community Name and Rank (as applicable)*
Grassland	Serpentine bunchgrass grassland Valley needlegrass grassland Non-native grassland	California annual grassland mapping unit California annual grassland with native component mapping unit Introduced coastal perennial grassland alliance	Purple needlegrass grassland (Serpentine bunchgrass; G2, S2.2)* (Valley needlegrass grassland; G4, S3?)* Various semi-natural stands (not ranked)
Herbaceous wetland	Freshwater marsh-wetland	Bulrush-cattail-spikerush marsh mapping unit	Western rush marshes (G4? S4?)*
Coyote brush scrub	Northern coastal scrub	Coyote bush	Coyote brush scrub (G5, S5)
Coffeeberry scrub	Northern coastal scrub	Coffeeberry	California coffee berry scrub (G4, S4)
Hollyleaf cherry chaparral	Northern coastal scrub	Hollyleaved cherry	Holly leaf cherry chaparral (G3, S3)*
Poison oak scrub	Northern coastal scrub	Poison oak	Poison oak scrub (G4, S4)
Arroyo willow thicket	Central Coast arroyo willow riparian forest	Willow mapping unit	Arroyo willow thickets (G4, S4)*
Coast live oak woodland	Mixed evergreen forest/ coast live oak woodland	Coast live oak	Coast live oak woodland (G5, S4)
Douglas fir forest	Douglas fir forest/upland redwood forest	Douglas fir	Douglas fir-tanoak forest (G4, S4), Douglas fir forest (G5, S4)
Coast redwood forest	Douglas fir forest/upland redwood forest	Coast redwood	Redwood forest (G3, S3)* (not in CNDDB)
Eucalyptus groves	Non-native forests	Eucalyptus	Eucalyptus groves (not ranked)
Monterey cypress or Monterey pine stands	Non-native forests	Monterey cypress or Monterey pine stands	Semi-natural woodland stands (not ranked)
Tanoak forest	Not recognized in Peninsula Watershed Management Plan or management plan EIR	Tanoak	Tanoak forest (G4, S3.2)*
Developed/disturbed	Urban, cultivated	Disturbed; built-up urban disturbance	No equivalent

NOTES:

* Asterisk indicates sensitive natural community, because of a Global (G) or State (S) rank of 1, 2 or 3; or identified as a wetland or riparian habitat and therefore considered sensitive according to CEQA section 15380.

"?" Question mark indicates that the vegetation is integral to the rarity ranking for the vegetation alliance and that more information is needed.

CNDDB = California Natural Diversity Database

SOURCES: San Francisco Planning Department, 2001; SFPUC, 2007; Schirokauer et al., 2003; Sawyer et al., 2009; California Native Plant Society and California Department of Fish and Wildlife, 2009; California Natural Diversity Database, 2010.

24 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002.

25 AECOM, *Draft Natural Environment Study*, July 2017.

26 San Francisco Planning Department, *Final Environmental Impact Report, Lower Crystal Springs Dam Improvements Project*, Planning Department Case No. 2006.0536E, State Clearinghouse No. 2007012002, October 7, 2010.

The SFPUC performs ongoing maintenance and management of watershed facilities and lands. These activities include projects that periodically require the presence of maintenance vehicles, equipment, and materials, along with earth movement and vegetation management. For example, the SFPUC annually mows watershed roads and maintains them (e.g., patching) every two to five years, including the Fifield-Cahill ridge trail. In addition, SFPUC staff manages wildfire risk by reducing fuel loads and maintaining fuelbreaks of up to 50 feet wide throughout the watershed, including along the southern skyline ridge trail alignment and along Fifield Ridge, north of Five Points. This work involves tree maintenance and vegetation clearing, as needed, typically on four-year intervals.[27] As described more fully in Section 4.8.2.5, *Invasive Species*, sudden oak death (*Phytophthora ramorum*) within the watershed has decimated stands of coast live oak and tanoak in portions of the project area. In the course of and in addition to regular fuel maintenance activities, SFPUC staff have worked to slow the spread of sudden oak death and minimize the risk of personal injury from falling trees or wildfire by removing hundreds of infected trees, among other measures.

Grassland

The management plan EIR identifies three grassland types in the Peninsula Watershed: non-native grasslands, serpentine bunchgrass grassland, and valley needlegrass grassland, all of which are found in the project area. The 2003 Schirokauer et al. mapping recognizes non-native grasslands as the California annual grassland mapping unit and the introduced coastal perennial grassland alliance and does not include separate mapping for serpentine bunchgrass and valley needlegrass. Non-native grassland is widespread in California and often associated with past disturbances such as clearing or grazing, or is maintained as the result of fuelbreak management. Non-native annual grasslands are dominated by a variety of non-native, mostly annual grasses and herbs. Introduced coastal perennial grassland is dominated by velvet grass (*Holcus lanatus*), along with tall fescue (*Festuca arundinacea*), Harding grass (*Phalaris aquatica*), and perennial ryegrass (*Lolium perenne*). Serpentine bunchgrass grasslands occur within the project area as openings in coyote brush scrub where serpentine substrate is present; valley needlegrass grassland occurs in undisturbed openings with more typical soils.

Grassland is mapped in the project area for about 1 mile from the Skylawn Memorial Park to Cemetery Gate on the west side of Cahill Ridge. This is non-native annual grassland. Although the grassland habitat type is not mapped in the fuelbreaks where coyote brush habitat is masticated (ground up), annual grasses and weeds typical of non-native annual grassland are often found here. In the absence of repeated disturbance or management, the dominant woody species reassert themselves eventually, converting annual grassland to coastal scrub, oak woodland, or other habitat types.

Areas of native-dominated grassland occur as openings in coyote brush scrub or other vegetation. Undisturbed rocky areas with thin soil often support diverse, native-dominated grasslands, especially on Fifield Ridge. For example, valley needlegrass grassland is present on

[27] John Fournet, Community Liaison, SFPUC, Vegetation maintenance along Fifield-Cahill ridge trail (file note), May 12, 2017.

Fifield Ridge.[28] The 2003 Schirokauer et al. database mapping did not recognize these native-dominated grasslands due to their small size, as shown in Figure 4.8-1. However, they do appear in the mapping prepared for the management plan, which indicates such grasslands at several locations on Fifield Ridge in discontinuous stands northward from Five Points, and on Cahill Ridge southward from Five Points, adjacent to the Fifield-Cahill ridge trail.

Several special-status plant species reported as occurring in grassland types may also occur in small openings in other habitat types, or in rocky or moist sites containing mostly native herbs and grasses: Franciscan onion (*Allium peninsulare* var. *franciscanum*), woodland woollythreads (*Monolopia gracilens*), and Choris' popcornflower (*Plagiobothrys chorisianus* var. *chorisianus*).

Grasslands provide foraging habitat for many common and widespread species such as western fence lizard (*Sceloporus occidentalis*), gopher snake (*Pituophis melanoleucus*), California vole (*Microtus californicus*), Botta's pocket gopher (*Thomomys bottae*), and the raptors and carnivorous mammals that feed on these species.

Grasslands may also serve as foraging or dispersal areas for special-status species such as white-tailed kite (*Elanus leucurus*), merlin (*Falco columbarius*), American peregrine falcon (*Falco peregrinus anatum*), and American badger (*Taxidea taxus*). The endangered Mission blue butterfly (*Plebejus [=Icaricia, Aricia] icarioides missionensis*) occurs in grasslands; in the watershed this species spends its life cycle in grasslands, openings in shrub- or tree-dominated habitats, and roadsides.

Herbaceous Wetland

This habitat type is found where surface or subsurface soil saturation or ponding occurs for extended periods in the winter and spring, giving rise to the development of species uniquely adapted to these conditions. The predominant plant species found in herbaceous wetlands depends on the depth and duration of standing water and saturated soil. The management plan EIR identifies extensive wetlands along reservoir shores where a variety of sedges (*Carex* spp.), spikerush (*Eleocharis acicularis, E. macrostachya*), cattails (*Typha* spp.), and bulrush (*Bolboschoenus* spp.) grow.[29] Since the project area is situated along a ridgeline, herbaceous wetlands are generally too small to be picked up by existing watershed-scale vegetation mapping. Further, the predominant species are adapted to only brief periods of saturation and inundation, and so may be difficult to detect during drier periods. Typical species include meadow barley (*Hordeum brachyantherum*) and rush (*Juncus* sp.).[30]

A qualified biologist (employed by AECOM) mapped a small herbaceous wetland complex near the southern portion of the proposed southern skyline ridge trail alignment.[31] This wetland area is shown on Figure 2-3d. Other small herbaceous wetlands occur in the vicinity of Fifield-Cahill ridge trail, including a small potentially jurisdictional wetland located 9 feet from the proposed

[28] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources (p. III.E-3).
[29] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (p. V-19).
[30] AECOM, *Draft Natural Environment Study*, July 2017.
[31] Ibid.

loop trail. This wetland, shown on Figure 2-4, would not support breeding for California red-legged frog but could provide aquatic non-breeding habitat for this species.

Herbaceous wetlands, especially those with long periods of ponded water or soil saturation, are highly productive habitats and therefore important as nesting and foraging for a wide variety of insect, amphibian, reptile, bird, and mammal species. Small seasonal wetlands may support wildlife species that venture from other habitats to use wetlands as a source of water or cover.

Coyote Brush Scrub

Coyote brush scrub is a typical and extensive vegetation type, part of the broader category called northern coastal scrub in the management plan EIR. Coyote brush scrub is found on thin, rocky soils on the high, windswept ridges of the Santa Cruz Mountains. It consists of dense to moderately open shrub canopy with a sparse herbaceous understory. The dominant shrub in this habitat type is coyote brush (*Baccharis pilularis* var. *consanguinea*). Other common shrubs include poison-oak (*Toxicodendron diversilobum*), bush monkeyflower (*Mimulus aurantiacus*), and California coffeeberry (*Frangula californica*). The understory consists of cow parsnip (*Heracleum maximum*), false Solomon's seal (*Smilacina stellata*), California figwort (*Scrophularia californica*), California blackberry (*Rubus ursinus*), and soap plant (*Chlorogalum pomeridianum*). Douglas fir trees (*Pseudotsuga menziesii*) and coast live oak (*Quercus agrifolia*) invade this community in the absence of fire and may eventually overtop the shrubs. Small areas of native grasslands develop in pockets of clay soils; for example, areas of serpentine bunchgrass and valley needlegrass grassland occur on Fifield Ridge.[32] These communities are generally too small to be picked up by existing watershed-scale vegetation mapping. Where coyote brush scrub is treated by mastication for fuel management, a limited suite of native perennial species capable of growing through a thick layer of mulch are favored, including coyote brush, coffeeberry, and poison-oak; weedy, pioneering species such as wild oats (*Avena fatua*), ripgut brome (*Bromus diandrus*), and various weeds increase as well.

Coyote brush scrub is the most extensive habitat type in the project area, occupying most of Fifield Ridge, occasional openings on Cahill Ridge including the upper portion of Quarry Road, the eastern side of Cahill Ridge Road and Lifemark Road through Skylawn Memorial Park, and much of the northern section of the proposed southern skyline ridge trail. Special-status plants known to occur or with potential to occur in this habitat type within the project area include: western leatherwood (*Dirca occidentalis*), which occurs frequently in the coyote brush scrub on Fifield Ridge; Franciscan onion, observed in a few locations along Fifield Ridge Road near Portola Gate; arcuate bush mallow (*Malacothamnus arcuatus*) in areas of disturbance; the moss coastal triquetrella (*Triquetrella californica*) in gravelly openings; and bent-flowered fiddleneck in moist, rocky openings. Choris' popcornflower may occur in low, moist openings in coyote brush scrub.

Wildlife species found in coyote brush scrub include fence lizard, southern alligator lizard (*Gerrhonotus multicarinatus*), brush rabbit (*Sylvilagus bachmani*), coyote, bobcat (*Lynx rufus*), pocket

[32] Orion Environmental Associates, *Vegetation Surveys of the Peninsula Watershed*, As-Needed Operational Support Services Agreement CS-837-C, prepared for the San Francisco Public Utilities Commission, Land and Resources Management Section, 2010.

gopher, California vole, western scrub jay (*Aphelocoma coerulescens*), Bewick's wren (*Thryomanes bewickii*), wrentit (*Chamea fasciata*), and spotted towhee (*Pipilo crissalis*). This habitat also provides foraging habitat for many raptor species that prey on the many small vertebrates and insects found here. Special-status animals potentially present in this habitat type include San Bruno elfin butterfly (*Callophrys mossii bayensis*), found on rock outcrops with its food plant, Pacific stonecrop (*Sedum spathulifolium)*; Mission blue butterfly, found in small grassy openings in coyote brush scrub; San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*), which creates stick nests in the brush and feeds on oaks and other foliage; and occasionally American badger. Coyote brush scrub also serves as dispersal habitat for special-status species, including California red-legged frog and San Francisco garter snake.

Coffeeberry Scrub

Coffeeberry scrub is another vegetation type present within the northern coastal scrub mapping unit. Coffeeberry scrub is similar to coyote brush scrub but grows in moister, sheltered, shady canyons. The dominant species are California coffeeberry, growing in dense cover co-dominated by coyote brush, and poison-oak; with a lush understory of cow parsnip, California figwort, death-camas (*Toxicoscordion fremontii*), and wood fern (*Dryopteris arguta*), among others. Coffeeberry scrub reportedly replaces coyote brush scrub in more shady environments and in the absence of fire or other disturbance.[33]

The management plan EIR presents this habitat type as mapped in small patches in sheltered portions of Fifield Ridge, as openings in the forest on Cahill Ridge and Quarry Road, and more extensively on the steep, sheltered, east- and north-facing canyons along the proposed southern skyline ridge trail alignment. The special-status plant western leatherwood occurs in this habitat type. Wildlife habitat in coffeeberry scrub is similar to that of coyote brush scrub, with many birds, rodents, and reptiles living in the relatively diverse scrub habitat, as well as numerous predators such as coyote, bobcat, gray fox (*Urocyon cinereoargenteus*), and foraging raptors. Special-status animals potentially found in this habitat include San Francisco dusky-footed woodrat and American badger. Other species, such as San Francisco garter snake, California red-legged frog, and many bird species may use coffeeberry scrub for dispersal habitat.

Hollyleaf Cherry Chaparral

Hollyleaf cherry chaparral is another vegetation type recognized within the northern coastal scrub mapping unit identified in the management plan EIR. Hollyleaf cherry chaparral is similar to coyote brush scrub but grows on wetter, often north-facing slopes. The dominant species is hollyleaf cherry (*Prunus ilicifolia*), an evergreen shrub to small tree. Because of the species' ability to sprout vigorously from its burl-like swollen root crown, it forms a dense and somewhat low-diversity stand strongly dominated by this single species. Associated species could include those found in coffeeberry scrub.[34] This habitat type is mapped in very small patches in sheltered

[33] Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, *A Manual of California Vegetation*, Second Edition, California Native Plant Society and California Department of Fish and Game, Sacramento, CA, 2009.
[34] Ibid.

portions of Fifield Ridge. This relatively uncommon habitat type is ranked G3 and S3 in the diversity database.

Wildlife in hollyleaf cherry chaparral is similar to that found in coyote brush scrub; hollyleaf cherry often produces large annual crops of fleshy fruits, which are sought out by birds, bobcat, gray fox, coyote, and rodents. Special-status animals potentially found in this habitat include San Francisco dusky-footed woodrat and American badger. Other species, such as San Francisco garter snake, California red-legged frog, and many bird species, may use hollyleaf cherry chaparral for dispersal habitat.

Poison-Oak Scrub

As the name suggests, poison-oak scrub contains poison oak as more than half of the relative cover in the shrub canopy.[35] As the third and most limited habitat type within the northern coastal scrub recognized in the management plan EIR, poison-oak scrub contains lesser amounts of typical shrubs, such as coyote brush, coffeeberry, bush monkeyflower, and toyon (*Heteromeles arbutifolia*); plus species adapted to moister site conditions such as blue elderberry (*Sambucus nigra* ssp. *caerulea*) and thimbleberry (*Rubus parviflorus*). This habitat occurs on the immediate coast in *mesic* (i.e., moist) hollows and on sheltered mesic slopes and disturbed dry slopes. This habitat type is persistent and relatively low in species diversity. In the project area, it is found in relatively small patches in sheltered, moist canyons along the entire project area, often in patches within mapped areas of coffeeberry scrub and coyote brush scrub. Surveys have been limited in poison-oak scrub,[36] but the mesic, sheltered, and fairly typical soil conditions together with low species richness suggest a low potential for special-status plants to occur in this habitat type. Wildlife habitat in poison-oak scrub is similar to that found in coffeeberry scrub, described above.

Arroyo Willow Thicket

This habitat is characterized by a predominance of arroyo willow (*Salix lasiolepis*) in the tree or shrub canopy. Plant associates may include shrubs or trees from adjacent habitat types as well as more moisture-dependent species such as dogwood (*Cornus sericea*), California wax-myrtle (*Morella [=Myrica] californica*). Other willow species may be present, in addition to understory species typical of wetlands, such as rushes, sedges (*Carex* spp.), California blackberry, wood fern, and sneezeweed (*Helenium puberulum*).

This habitat extends nearly to the top of the eastern slope of Fifield Ridge and is mapped near the project area there. The Natural Environment Study[37] and SFPUC Natural Resources staff[38] identify small drainages and seeps supporting arroyo willow along the proposed southern skyline ridge trail alignment. These communities within the project area are generally too small to be picked up by existing watershed-scale vegetation mapping. No special-status plants are

35 Ibid.
36 Ibid.
37 AECOM, *Draft Natural Environment Study*, July 2017.
38 San Francisco Public Utilities Commission, Natural Resource observations for Upper Fuelbreak 35, March 3, 2015.

considered likely to occur within this habitat in the project area, although Choris' popcornflower could occur in arroyo willow thickets and adjacent herbaceous wetlands, if present.

The availability of season-long or potentially year-round water makes this habitat highly productive of vegetation and insect life, and the cover provided by the dense willows creates diverse habitat for wildlife, with many species of amphibians, reptiles, mammals, and especially birds dependent on this habitat for foraging and nesting and as a movement corridor. Typical species include rough-skinned newt (*Taricha granulosa*), western toad (*Anaxyrus boreas*), raccoon (*Procyon lotor*), black phoebe (*Sayornis nigricans*), Bewick's wren, and several hummingbird species. Many special-status species may use arroyo willow for portions of their habitat requirements, such as San Francisco garter snake, California red-legged frog, San Francisco dusky-footed woodrat, several bat species, Vaux's swift (*Chaetura vauxi*), Cooper's hawk (*Accipiter cooperii*), western pond turtle, Pacific giant salamander (*Dicamptodon ensatus*), and Santa Cruz black salamander (*Aneides niger*).

Coast Live Oak Woodland

Coast live oak woodland is dominated by coast live oak, with a variety of other trees sometimes present, such as California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), and, in moister sites in the project area, madrone (*Arbutus menziesii*) and Douglas fir. The understory is the most common and variable element of the mixed evergreen forest/coast live oak woodland community type described in the management plan EIR. The understory is highly variable depending on the density of tree cover; under dense forest, the understory is often sparse and mostly herbaceous, while a sparse canopy is often associated with substantial and diverse shrub cover and a variety of herbs. In the absence of fire, coast live oak grows through and ultimately overtops coastal scrub and coffeeberry scrub, so in the project area where fire has been absent for many decades, young to moderately mature coast live oaks may be seen in association with aging coastal scrub species.

This habitat type and other forest types containing members of the oak family are threatened by sudden oak death, which has decimated coast live oaks and the related genus tanoak (*Notholithocarpus [=Lithocarpus] densiflorus*) in the watershed.

Coast live oak woodland occurs along the Fifield-Cahill ridge trail, generally in small patches on the northeast-facing side of the ridges, and in the lower portion of Quarry Road. It is limited along the southern skyline ridge trail alignment. Several special-status plants have potential to occur in this habitat type: Franciscan onion could occur in rocky openings; San Francisco collinsia (*Collinsia multicolor*) could occur on steep, rocky slopes; less likely is San Mateo woolly sunflower (*Eriophyllum latilobum*), which is also seen in steep, sheltered, filtered shade in coast live oak woodland.

Because coast live oak woodland is a variable habitat type, it supports a wide range of wildlife species and a variety of trees and shrubs that provide nesting habitat for many bird species. Acorns provide food for many insects, larger birds, and many mammal species. A number of bird species that depend on habitat edges are found in oak woodland and adjacent grassland or brush.

Typical species include several species of salamanders and newts, fence lizard, Sierran treefrog (*Pseudacris sierra*), black-tailed deer (*Odocoileus hemionus*), great horned owl (*Bubo virginianus*), acorn woodpecker (*Melanerpes formicivorus*), western scrub jay, and striped skunk, to name a few. Special-status species associated with coast live oak woodland include Cooper's hawk, merlin (*Falco columbarius*), hoary bat (*Lasiurus cinereus*), fringed myotis (*Myotis thysanodes*), and San Francisco dusky-footed woodrat.

Douglas Fir Forest

This habitat type is dominated by a single species, Douglas fir, a tall, long-lived (500 years or more) conifer. In the project area it is commonly associated with big-leaf maple (*Acer macrophyllum*), coast live oak, California bay, canyon live oak (*Quercus chrysolepis*), tanoak, and madrone. The understory is usually sparse because of the typically dense canopy and shady conditions at ground level and the heavy accumulation of litter. Huckleberry (*Vaccinium ovatum*), sword fern (*Polystichum munitum*), and redwood sorrel (*Oxalis oregana*) are often most abundant under gaps in the forest canopy. Areas containing these species but not dominated by Douglas fir might be considered mixed evergreen forest, but the SFPUC mapped these trees as Douglas fir because of their dominance as the tallest trees in the habitat. Although the diversity database gives Douglas fir forest with tanoak associates a global and state rank of G4/S4, old-growth stands on the watershed are considered sensitive habitats.[39]

In San Mateo County, Douglas fir forest is limited to fog-influenced areas near the coast. Douglas fir forest is the primary habitat type on Cahill ridge and a small portion of the upper Quarry Road, and is also found along the southern one-third of the proposed southern skyline ridge trail alignment. Special-status plants potentially occurring in this habitat type include Montara manzanita (*Arctostaphylos montaraenesis*), Kings Mountain manzanita (*A. regismontana*), and Dudley's lousewort (*Pedicularis dudleyi*).

The value of habitat for wildlife is proportional to the habitat's structural diversity and plant species diversity and increases with maturity of the forest. Old-growth stands have more diversity than second-growth stands. Douglas fir forest provides cover and nesting areas for raptors and *pelagic* (seagoing) birds that nest in large trees near the coast. Small birds feed on seeds and insects. This habitat type supports more amphibians than many because of the moist environment sustained within the forest. Typical animals found in Douglas fir forest include slender salamander (*Batrachoseps attenuatus*), gray fox, western gray squirrel *(Sciurus griseus*), great horned owl, and Steller's jay (*Cyanocitta stelleri*). Special-status species potentially occurring in this habitat include sharp-shinned hawk (*Accipiter striatus*) and Santa Cruz black salamander (*Aneides niger)*. Northern spotted owl (*Strix occidentalis*) and marbled murrelet (*Brachyramphus marmoratus*) are reported to occur in old-growth Douglas fir forest, and the latter is known to breed in this habitat in the Pilarcitos Creek watershed to the west of Cahill Ridge. As discussed in Section 4.8.2.8, *Special-Status Species*, these species are unlikely to occur in secondary growth Douglas fir forest within the project area. California Natural Diversity Database Occurrence 85 records the observation of California

[39] San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Figures 2-6, 2-7 (pp. 2-11, 2-13), Spring 2002.

giant salamander a short distance from the project area at Five Points. The Douglas fir forest on Cahill Ridge may also provide upland habitat for this species.

Coast Redwood Forest

This habitat type is dominated by coast redwood, a very tall (up to nearly 400 feet in height) and long-lived (up to 2,200 years) evergreen conifer.[40] Associated tree species are Douglas fir, tanoak, madrone, and California bay. This habitat type is found in moist coastal areas with heavy summer fog. It is also found in sheltered, moist locations along streams and canyons and in areas with seeps and springs. Alluvial terraces, benches, and deep soils are where coast redwoods grow most abundantly. Coast redwood is shallow-rooted and is therefore sensitive to soil compaction around its roots.[41] Due to the dense canopy and heavy accumulation of leaf litter, the understory in coast redwood forest is usually fairly limited to redwood sorrel, sword fern, huckleberry, salal (*Gaultheria shallon*), and bracken fern (*Pteridium aquilinum*). The CNDDB gives upland redwood forest a global and state rank of G3/S3, and stands of redwoods on the watershed, even second-growth forests, are considered sensitive habitats.[42]

In the project area, coast redwood forest is mapped only along the southernmost mile of the proposed southern skyline ridge trail alignment. In the watershed, coast redwood forest typically occurs on sheltered northeast-facing slopes on neutral (non-acidic) soils. It is reported that nearly all redwoods on the watershed were cut some 150 years ago and that today's trees are second-growth.[43] The SFPUC has removed hazardous tanoaks adjacent to its southern fuelbreak, while the remaining tanoak in the project area have decomposed on the stump and collapsed after being killed by sudden oak death. The tanoak burls are sprouting but show evidence of continued infestation by this pathogen. Special-status plants potentially occurring in this habitat type include Montara manzanita, Kings Mountain manzanita, and Dudley's lousewort.

As previously described, the value of habitat for wildlife is proportional to the habitat's structural diversity and plant species diversity and increases with maturity of the forest. Old-growth stands have more diversity than second-growth stands. Coast redwood forest provides cover and nesting areas for raptors and pelagic birds that nest in large trees near the coast. Small birds feed on seeds and insects. This habitat type supports more amphibians than many because of the moist environment sustained within the forest. Typical animals found in coast redwood forest include slender salamander, gray fox, great horned owl, and Steller's jay. Special-status species potentially occurring in this habitat include sharp-shinned hawk and Santa Cruz black salamander. Northern spotted owl and marbled murrelet are reported to occur in old-growth redwood forest. These species are unlikely to occur in redwood forest within the project area, although marbled murrelet is reported from old-growth Douglas fir forest in the Pilarcitos Creek watershed to the west of Cahill Ridge.[44]

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40 Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, *A Manual of California Vegetation*, Second Edition, 2009.
41 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002.
42 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Figures 2-6, 2-7 (pp. 2-11, 2-13), Spring 2002.
43 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002.
44 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section V.E, Natural Resources (p. V-25).

Tanoak Forest

This habitat type is strongly dominated by tanoak, a slow-growing, shade-tolerant evergreen hardwood that can achieve a height of 150 feet. In this habitat type, tanoak contributes the majority of canopy cover, co-dominant with bigleaf maple, madrone, Douglas fir, coast redwood, coast live oak, and California bay, among others. Tanoak forest can be an important element of the shrub layer as well, where huckleberry is another important species. Tanoak sprouts readily following fire or cutting. The diversity database rarity status for tanoak forest is G4, S3.2, although Sawyer et al. note that sudden oak death is affecting many stands and may present a threat beyond the generally recognized issues of habitat loss, timber management practices, and feral pigs.

Tanoak forest is mapped in the project area along the southern portion of the proposed southern skyline ridge trail alignment, where sudden oak death has severely affected this habitat. As indicated previously for coast live oak woodland, many mature trees have succumbed to infection; the SFPUC has cut down hazardous trees, and the resulting mass of crown sprouts show evidence of the disease. This loss in the canopy alters light conditions on the forest floor and dramatically alters habitat values; sudden oak death is discussed further in Section 4.8.2.5, *Invasive Species*.

Although no special-status plants known to occur in the region are specifically associated with tanoak forest, special-status plants potentially occurring in this habitat type include Montara manzanita and Kings Mountain manzanita. Although sudden oak death has heavily affected this habitat type, where tanoak forest remains its habitat value is considerable because the dominant species produces large seed crops almost every other year. Common wildlife species expected in tanoak forest are much the same as those in Douglas fir and coast redwood forests. Special-status species potentially occurring in this habitat could include sharp-shinned hawk, California giant salamander, and Santa Cruz black salamander.

Eucalyptus Groves

Eucalyptus groves are non-native forests. Blue gum eucalyptus (*Eucalyptus globulus*) is the dominant eucalyptus species on the watershed. These stands were often planted as trees, groves, and windbreaks, but the trees have become naturalized and have spread, sometimes quite aggressively, in moist coastal areas and stream courses.[45] Mature eucalyptus stands have heavy litter accumulation and very limited species richness in the understory, in part because the leaf litter contains *allelopathic* (germination-inhibiting) chemicals. Poison-oak is noted as an understory associate.[46] Only one small area of eucalyptus grove habitat occurs in the project area—on Cahill Ridge just north of the junction with Quarry Road. No special-status plants are expected in this habitat type.

The value of this habitat for wildlife is limited because of the lack of plant diversity in the canopy and the understory. Raptors may use the dense groves for roosting and hunting perches, and

45 Ibid.
46 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Spring 2002.

hummingbirds feed on nectar and insects in the foliage.[47] Monarch butterflies (*Danaus plexippus*) may overwinter in eucalyptus groves.

Monterey Pine or Monterey Cypress Stands

Stands of Monterey pine (*Pinus radiata*) and Monterey cypress (*Hesperocyparis [=Cupressus] macrocarpa*) were planted extensively on the Peninsula Watershed approximately 150 years ago[48] to aid in collecting fog drip, with the intention of augmenting the water collection function of watershed lands. The Monterey cypress stands have re-seeded only moderately, so that the decades-old stands consist of very large trees, sometimes still visible in linear rows and columns. In dry areas, the trees form a dense, shady overstory with very little undergrowth; in moist areas, the cypress trees are growing old and dying while native habitats such as coast live oak forest and coffeeberry scrub develop underneath. Because Monterey pine seeds spread more successfully, the stands of these trees are of mixed ages and have less definite boundaries and more native understory, whereas the pines are spreading into native habitat.

A large Monterey cypress stand extends along much of Quarry Road up to and including portions near Skylawn Memorial Park, while smaller stands of both Monterey cypress and Monterey pine grow in patches, many too small to map, along the proposed southern skyline ridge trail alignment. No special-status plant species are expected to grow in most of these patches, although western leatherwood grows at the edges of the Monterey cypress forests between S.R. 35 and Old Cañada Road.

Wildlife rarely use these non-native stands because of the dense canopy and limited understory vegetation. Raptors may use the dense canopy for roosting and hunting perches, but no other special-status wildlife species are expected in this habitat type.

Developed/Disturbed Areas

Developed and disturbed areas are not a natural vegetation habitat type; rather, they are areas where landowners have removed natural vegetation, installed structures, paving, and/or landscaping, and perform maintenance of the land cover. In the project area, Skylawn Memorial Park is mapped as developed, as is the Skyline Quarry area and the turnout on the southeastern corner of S.R. 92 and S.R. 35. No special-status plants are expected in developed habitats.

Wildlife habitat value is dependent on the nature and structure of the developed habitat; the more buildings, pavement, and low-diversity landscaping (e.g., lawn), the less abundant and diverse the wildlife. Animals using developed areas tend to be common wildlife with a wide range of ecological tolerances, such as raccoon, opossum (*Didelphis virginiana*), striped skunk (*Mephitis mephitis*), house finch (*Carpodacus mexicanus*), starling (*Sturnus vulgaris*), and brown towhee (*Pipilo fuscus*). No special-status animal species are expected to use developed areas, except to pass through.

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47 Ibid.

48 Oberlander, G.T., *The Taxonomy and Ecology of the Flora of the San Francisco Watershed Reserve*, doctoral dissertation, Stanford University, 1953.

4.8.2.5 Invasive Species

Invasive Plants

As described in the management plan EIR, a number of invasive plants have been reported to occur on the watershed and are problematic.[49] The management plan EIR recognizes that *exotic* (non-native) forests dominated by eucalyptus, Monterey pine, and Monterey cypress are invasive and aggressive outside of their natural range.[50] Other invasive plant species mentioned in the management plan and known to be present in the project area include pampas grass (*Cortaderia jubata*), Australian fireweed (*Erectites minima=Senecio minimus*), hawthorn (*Crataegus monogyna*), gorse (*Ulex europaea*), French broom (*Genista monspessulana)*, Cape ivy (*Delairea odorata*), and purple star thistle (*Centaurea calcitrapa*). Other species ranked by the California Invasive Plant Council (Cal-IPC)[51] as moderate or high in invasiveness have been observed in or near the project area, including poison hemlock (*Conium maculatum*), fennel (*Foeniculum vulgare*), Algerian ivy (*Hedera canariensis*), English holly (*Ilex aquifolium*), and big periwinkle (*Vinca major*).

New plant species are continually introduced in California; some become invasive based on the interaction between their inherent ecological characteristics and prevailing site conditions. Since the management plan was prepared and the EIR certified, a number of highly invasive plants have become problematic in nearby parts of San Mateo County, as ranked by Cal-IPC, such as water hyacinth (*Eichhornia crassipes* – high, red alert), stinkwort (*Dittrichia graveolens* – moderate, red alert), Himalayan blackberry (*Rubus armeniacus* – high), yellow star thistle (*Centaurea solstitialis* – high), Spanish broom (*Spartium junceum* – high), and slender false-brome (*Brachypodium sylvaticum* – moderate, red alert).[52] The SFPUC periodically assesses and maps invasive plants to ensure its priorities are consistent with management needs. Current SFPUC invasive plant management practices include the following components, although there is no formal management plan:

- Prevention best management practices
- Early detection and surveillance schedules
- Prioritization models
- Adaptive management
- Ecological approach to invasive plant management (including the Bradley method)
- Invasive plant containment and control strategies
- Control methods (mechanical, cultural, biological and chemical).

49 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources (p. III.E-6).
50 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources (p. III.E-11).
51 California Invasive Plant Council, *California Invasive Plant Inventory, Cal-IPC, Berkeley*, 2006, http://cal-ipc.org/, accessed April 12, 2017.
52 California Invasive Plant Council, *Invasive Plant Inventory Database*, *http://cal-ipc.org/paf/*, accessed May 27, 2017.

Invasive Pathogens

Phytophthora are a group of plant pathogens commonly referred to as "water molds." The genus Phytophthora contains more than 150 species that have different host ranges, varying environmental preferences, and gradients of environmental impact that depend on site conditions. Well-known Phytophthoras include *P. infestans*, the causal agent of potato late blight and the subsequent Irish potato famine, and *P. ramorum*, the plant pathogen known to cause sudden oak death.

First detected in 1994 in California, the pathogen *P. ramorum* probably originated in infected nursery stock and was found in 2000 to be the causal agent of sudden oak death, which infected and caused great mortality among tanoaks and coast live oaks. By 2009, 17 more related *Phytophthora* species had been documented in California.[53,54]

Many native woody species are hosts of the sudden oak death pathogen. California bay is the primary infectious agent, although *sporangia* (buds or spores) are also released from tanoak twigs and leaves. In addition to bay and tanoak, other hosts in the watershed include Montara manzanita (*Arctostaphylos montaraensis*), Giant chinquapin (*Chrysolepis chrysophylla* var. *minor)*, coast live oak, Pacific madrone (*Arbutus menziesii*), and coffeeberry (*Rhamnus californica*). Montara manzanita has shown symptoms of *P. ramorum* infestation on Montara Mountain in the Peninsula Watershed, and sudden oak death could also affect the closely related King's Mountain manzanita (*A. regismontana*).[55] Both species may potentially occur in certain habitat types in the project area (see Table 4.8-2).

The prevalent mode of sudden oak death transmission in forests is by air, although human activities have been documented to spread the pathogen, as individuals and vehicles carry infested soil on shoes and tires or otherwise move infested plant materials (i.e., California bay leaves).[56] The disease is primarily spread in spring, and most sporangia are released with warm temperatures during rainy, wet conditions. Splashing or running water spreads the propagules, which may travel for longer distances during strong winds that transport raindrops and sporulating leaves (i.e., infested leaves actively releasing sporangia). Oak mortality has been reported in the range of 3 to 5.5 percent per year, depending on the site, with older trees more vulnerable than younger ones. Tanoak mortality in infested sites has been observed at 5.5 to 6 percent per year, with limited evidence of resistance in the population. Modeling suggests that the complete loss of tanoaks as a co-dominant overstory species is likely to occur in large portions

53 Rizzo, David and Elizabeth Fichner, *Phytophthora in Forests and Natural Ecosystems of the Americas*, Proceedings of the Fourth Meeting of IUFRO Working Party S07.02.09, Pacific Southwest Research Station General Technical Report PSW-GTR-221, May 2009, pp. 35-44.

54 Yakabe, L.E., C.L. Blomquist, S.L. Thomas, and J.D. MacDonald, Identification and frequency of *Phytophthora* species associated with foliar diseases in California ornamental nurseries, *Plant Disease* 93: 883-890, 2009, https://www.fs.usda.gov/treesearch-beta/pubs/52858, accessed May 28, 2017.

55 California Oak Mortality Task Force, *Phytophthora ramorum hosts reported since 2012/2013 and missing from the APHIS P. ramorum host or associated host list*, July 23, 2018, *http://www.suddenoakdeath.org/wp-content/uploads/2018/10/P-ramorum-hosts-detected-since-2012.pdf*, accessed October 11, 2019.

56 Swiecki, Tedmund J. and Elizabeth A. Bernhardt, *A Reference Manual for Managing Sudden Oak Death in California*, Pacific Southwest Research Station General Technical Report PSW-GTR-242, December 2013.

of the tanoak's geographic range, although researchers are investigating the presence of resistant strains of tanoak within the general population.[57]

Sudden oak death is known to be present in a number of locations on the Peninsula Watershed, and forest pathologist Dr. Matteo Garbelotto has followed sudden oak death in 16 permanent plots during the past nine years. In these plots, 24 percent of coast live oaks have become infected with sudden oak death and 17 percent have died; the larger and older trees are more vulnerable to infection and death. Based on Dr. Garbelotto's findings, the spread of sudden oak death has the potential to cause dramatic changes in the structure, composition, and *carrying capacity* (maximum number of the species that can be sustained) of all tree-dominated natural communities and some oak/shrub-dominated communities on the Peninsula Watershed, and researchers are actively investigating methods to limit the spread and ameliorate the effects of this devastating pathogen.

Sudden oak death may be a more devastating disease in habitats where tanoak is dominant. Tanoak is both infectious and extremely susceptible to the disease, and local adult mortality is already approaching 100 percent in several sites on the San Francisco Peninsula.[58] Transmission of sudden oak death originates with *sporulation* (asexual reproduction) and release from California bay leaves and tanoak leaves and stems; mortality occurs among tanoak and coast live oak, but not California bay, which merely serves as a host. Temperature, rainfall, density of infested trees, sporulating individuals, oak size, oak to bay distance, and aspect are all factors that influence the rate and degree of infestation and resulting mortality among susceptible species.[59]

The Peninsula Watershed as a whole has been affected by sudden oak death, and the full effects of the disease have not been felt because infestation among susceptible species continues to rise. Coast live oaks are a common and abundant tree on the watershed, and California bays and tanoaks are important trees in several forest habitat types. The redwood, tanoak, and mixed hardwood forests at the southern end of the southern skyline ridge trail are heavily affected, and many if not most tanoaks are experiencing severe symptoms. Impacted trees—and study sites where sudden oak death is being investigated—are scattered throughout the San Mateo Creek and Pilarcitos Creek watersheds on both sides of the Fifield and Cahill ridges. The oak trees along the ridgeline in this area have not become fully infested. At present, plants invested with sudden oak death on the watershed are highly clustered, both at the individual tree level and at the plot level.[60] This clustering could indicate that full infestation at the landscape scale has not occurred.

Large coast live oaks are more susceptible to sudden oak death than smaller trees. This suggests that the structure of mature coast live oak habitats could be greatly degraded even if only a moderate number of these large individuals are killed. The result could be dramatic changes in wildlife habitat characteristics, food availability, shading, temperature and humidity regulation in the understory, litter accumulation, and competitive relationships among species. Mature coast

57 Garbelotto, Matteo and Katherine J. Hayden, "Sudden Oak Death: Interactions of the Exotic Oomycete *Phytophthora ramorum* with Naïve North American Hosts," *Eukaryotic Cell* 11(11): 1313-1323, 2012, http://ec.asm.org/, accessed May 24, 2017.

58 Garbelotto, Matteo, Sixth Sudden Oak Death Science Symposium Field Trip narrative, June 21, 2016, *ucanr.edu/sites/sod6/files/237290.pdf,* accessed August 8, 2017.

59 Garbelotto, Matteo and Laura Sims, *Progress Report on Distribution of Phytophthora ramorum, Sudden Oak Death, Across the SFPUC Holdings in San Mateo County*, unpublished report prepared for SFPUC, January 2017, 18 pp.

60 Ibid.

live oaks are much more productive of acorns than are small trees, for example, and many wildlife species depend on this food resource.

In addition to the sudden oak death pathogen, other *Phytophthora* species are present on the watershed and do not appear to be fully distributed in the landscape. Garbelotto and Sims[61] report that *P. nemorosa* is present in the Pilarcitos drainage. This species is similar to the sudden oak death pathogen and causes similar leaf blight and shoot dieback but does not cause widespread mortality of oak trees.[62]

In a 2013 study, Swiecki and Bernhardt[63] reported that seven additional species of *Phytophthora* were present on the Peninsula Watershed: *P. cinnamomi, P. cambivora, P. cactorum, P. cryptogea, P. megasperma, P. 'chlamydo'* (now recognized as *P. chlamydospora*[64]), and *P. gonapodyides*. The study's authors report detection of *P. cinnamomi* and *P. cambivora* in nine locations each*; P. cactorum* in eight locations*; P. cryptogea, P. megasperma,* and *P. chlamydospora* (*chlamydo*.) in two locations each, and *P.gonapodyides* in one location. Most detections were in the south skyline portion of the project area. *P. crypogea* was detected near Cemetery Gate and there were no detections north of this point.[65] All of these species are reported to be primarily soil-borne rather than primarily airborne as with *P. ramorum*. Swiecki and Bernhardt concluded that of the seven other (non-sudden oak death) *Phytophthora* species, several pose considerable threats to watershed native plant communities.[66] *Phytophthora cinnamomi* causes lethal diseases in an unusually large number of plant species, including madrones and many other woody *dicot* species (flowering plants with two seed leaves) and conifers. In Australia, *P. cinnamomi* has invaded and devastated several hundred thousand acres of native forests and has brought a number of Australian rare plant species to the brink of extinction.[67] In California, *P. cinnamomi* causes severe damage to coast live oaks, madrones, and manzanitas, all of which are present on the watershed (including two rare manzanitas). *P. cinnamomi* is more widespread on the watershed than other species of *Phytophthora*, but studies have yet to establish why.[68]

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61 Ibid.

62 Hansen, E.M, P.W. Reeser, J.M. Davidson, M. Garbelotto, K. Ivors, L. Douhan, and D.M. Rizzo, *Phytophthora nemorosa*, a New Species Causing Cankers and Leaf Blight of Forest Trees in California and Oregon, USA, *Mycotaxon*, 86:129-138, October-December 2003.

63 Swiecki, Tedmund and Elizabeth Bernhardt, *The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, San Francisco, September 2013, 23 pp.

64 Hansen, Everett M., Paul Reeser, Wendy Sutton and Clive M. Brasier, Redesignation of *Phytophthora* taxon *Pgchalamydo* as *Phytophthora chlamydospora* sp. Nov., North American Fungi, 10(2):1-14, May, 2015, *http://www.pnwfungi.org/index.php/pnwfungi/article/view/1414*, accessed October 9, 2017.

65 Swiecki, Tedmund and Elizabeth Bernhardt, The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed, (Figure 1 and Table 1), September 2013, 23 pp.

66 Swiecki, Tedmund and Elizabeth Bernhardt, The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed, September 2013, 23 pp.

67 Shearer, B.L., C.E. Crane, S. Barrett and A. Cochrane, *Phytophthora cinnamomi* invasion, a major threatening process to conservation of flora diversity in the South-West Botanical Province of Western Australia. Australian Journal of Boty 55:225-238, 2007, *in* Swiecki, Tedmund and Elizabeth Bernhardt, *The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, San Francisco, September 2013, 23 pp.

68 Swiecki, Tedmund and Elizabeth Bernhardt, The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed, September 2013, 23 pp.

Phytophthora cambivora is also an aggressive root pathogen with a wide host range. On the watershed, host plants of *P. cambivora* include madrone, toyon, coast live oak, and California bay. *Phytophthora cactorum* has a wide host range of at least 200 species, including genera found on the watershed such as oaks, maples, ceanothus, coffeeberry, monkeyflower, toyon, honeysuckle, arroyo willow and Douglas fir. *Phytophthora cryptogea* is a well-known root pathogen of Douglas fir and also infests monkeyflower, coffeeberry, and possibly California buckeye. Worldwide, this species is a major pathogen of both woody and herbaceous crops, although it does not commonly cause disease in native forests. The hazards presented by *P. megasperma, P. chlamydospora* and *P. gonapodyides* are more difficult to assess because these species' taxonomic classification is in flux, as some species were either recently discovered or were relatively recently detected in California. Indications are that their range of hosts may be more limited.[69] *Phytophthora megasperma* infests goldenrod (*Euthamia*), rushes, monkeyflower, madrone, and California bay. *Phytophthora chlamydospora* infests coffeeberry, and *P. gonapodyides* infests madrone.

Several of these pathogens were found in multiple locations at sites where native vegetation showed symptoms of disease. In the vicinity of the project, *P. cryptogea* was observed in two locations along Cahill Ridge Road in areas where planted Douglas fir are declining (i.e., in poor health), including one location near the water tank, close to the loop trail.[70] This pathogen is well known as a root pathogen of conifers, and researchers concluded it was introduced as part of a restoration planting. *Phytophthora cryptogea* and *P. cinnamomi*, both present in limited areas within the watershed, are capable of infesting Douglas fir; *P. cryptogea* is especially virulent under field conditions, particularly on Douglas fir seedlings.[71] These pathogens are of particular concern on the Peninsula Watershed because the old-growth stands of this sensitive natural community are unusually extensive and undisturbed.

Cunniffe et al.[72] modeled the spread of sudden oak death in California and concluded that despite extensive presymptomatic infection (i.e., trees became infected months or years before showing symptoms of disease) and frequent long-range transmission, the pathogen could have been effectively excluded from large parts of the state, in principle, if it had been aggressively pursued within the first few years of identification, and the epidemiology had been sufficiently understood to conduct large-scale management. These researchers conclude that full control may not be possible for the sudden oak death pathogen now.

Swiecki and Bernhardt suggest that most of the isolated *Phytophthora* infestations scattered around the watershed probably resulted from accidental introductions via equipment contaminated with infested soil.[73] The probability of successfully introducing and establishing *Phytophthora* species in

69 Ibid.
70 Ibid.
71 Pratt, R.G., L.F. Roth, E.M. Hansen, and W.D. Ostrofsky, Identity and Pathenogenicity of Species of *Phytophthora* Causing Root Rot of Douglas fir in the Pacific Northwest, *Phytopathology*, 66:710-714, June 1976.
72 Cunniffe, Nik, Richard C. Cobb, Ross K. Meentemeyer, David M, Rizzo and Christopher A. Gilligan, Modeling when, where and how to manage a forest epidemic, motivated by sudden oak death in California, *PNAS* 113:20, May 17, 2016, pp. 5,640 to 5,645, *www.pnas.org/lookup/suppl/doi: 10.1073/pnas.1602153113/-/DCSupplemental*, accessed May 26, 2017.
73 Swiecki, Tedmund and Elizabeth Bernhardt, *The Distribution and Management of Root-rotting Phytophthora Species on the Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, San Francisco, September 2013, 23 pp.

new areas increases with the amount of pathogen transported. As stated by the Working Group for Phytophthoras in Native Habitats,[74] once an area is contaminated, it is difficult to eradicate the pathogen and restore lands. The working group also states, "Due to the potential for irreparable, severe environmental damage to California's natural habitats, precautions to prevent pathogen introduction are warranted." Specific principles include minimizing the extent of project footprints and soil disturbance, requiring sanitation practices, and promoting prevention through education.

4.8.2.6 Sensitive Natural Communities

Sensitive natural communities and habitats include the following: plant species alliances as presented in A Manual of California Vegetation and identified by the diversity database as having global or state rank of 1, 2, or 3;[75] all riparian habitats, which are defined as sensitive natural communities under CEQA Guidelines Appendix G, checklist question IV.b; and sensitive habitats identified in the Peninsula Watershed Management Plan or in newer SFPUC surveys. *Ecologically sensitive zones* include special-status plants, serpentine soils, or areas that support special-status animal species. Sensitive natural communities in and near the project area are listed below.

- Serpentine bunchgrass
- Valley needlegrass grassland
- Herbaceous wetland
- Arroyo willow thicket
- Chaparral
- Coast redwood forest
- Douglas fir forest (old growth)
- Tanoak forest

Logging has considerably altered coast redwood, and sudden oak death has highly affected the tanoak associate found in coast redwood forest as well as the tanoak forest itself.

4.8.2.7 Wetlands and Other Waters

Section 4.8.3, Regulatory Framework, below, provides federal and state definitions of wetlands and waters. Federal and state jurisdictional waters include wetlands and other waters. The U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or California Department of Fish and Wildlife may regulate wetlands and other waters.

Several potential jurisdictional features have been reported in the project area. A wetland was mapped along the proposed southern skyline ridge trail alignment, and one potentially jurisdictional "other waters" drainage channel was observed there as well.[76] The latter two features are depicted on Chapter 2, Project Description, Figures 2-3c and 2-3d. Another potential wetland was observed near the proposed loop alignment and is depicted in Figure 2-4.

74 Working Group for Phytophthoras in Native Habitats, Guidance for Regulators to Reduce the Risk of *Phytophthora* and other plant pathogen introductions to restoration sites, draft, May 2, 2017, 6 pp.
75 Sawyer, John O., Todd Keeler-Wolf, and Julie Evens, *A Manual of California Vegetation Second Edition*, California Native Plant Society and California Department of Fish and Game, Sacramento, CA, 2009.
76 AECOM, Draft Natural Environment Study, July 2017.

4.8.2.8 Special-Status Species

A number of species known to occur in the Peninsula Watershed are protected under state and federal endangered species laws, or the California Department of Fish and Wildlife has designated them as species of special concern. In addition, section 15380(b) of the CEQA Guidelines defines rare, endangered, or threatened species that are not included in any listing.[77] Species recognized under these terms are collectively referred to as "special-status species." For this EIR, special-status species include:

- Plant and wildlife species listed as rare, threatened, or endangered under either the federal or state endangered species acts
- Plants identified as rank 1 or 2 by the California Native Plant Society (see notes in Tables 4.8-2 and 4.8-3)
- Species that are candidates for listing under either federal or state law
- Species designated by the California Department of Fish and Wildlife as species of special concern or fully protected
- Candidate species that may be considered rare or endangered pursuant to section 15380(b) of the CEQA Guidelines

As noted previously, the Natural Environment Study prepared for the portion of the project area south of S.R. 92 evaluates the potential for special-status species to occur. This study identifies seven special-status plant species with the potential to occur because appropriate habitat exists in the project area, but notes that no special-status plant species have been documented to occur in this area and none were identified during field studies for the report. The field studies did not, however, include the alignment of the proposed fencing. The results from the Natural Environment Study are incorporated into this section, which also addresses several additional special-status species known to occur in the portion of the project area along the Fifield-Cahill ridge trail. Because the management plan EIR was completed more than 15 years before the preparation of this EIR, the names, status, and occurrence data have changed for many species.

Tables 4.8-2 and 4.8-3 present the results of the California Native Plant Society, California Department of Fish and Wildlife, and U.S. Fish and Wildlife Service queries for those special-status plants and animals, respectively, known or with a moderate to high potential to occur in the project area. Appendix C includes corresponding species descriptions as well as the full results of the queries for special-status plants and animals, including those not expected or with low potential to occur in the project area.

[77] For example, vascular plants listed by the California Native Plant Society as rare or endangered or as rank 1 and 2 are considered subject to section 15380(b).

TABLE 4.8-2
SPECIAL-STATUS PLANT SPECIES PRESENT, OR WITH POTENTIAL TO OCCUR, IN THE PROJECT AREA

Common Name ***Scientific Name***	**Listing Status**	**Life Form**	**Flowering Period**	**Habitat Conditions**	**Potential to Occur**
Franciscan onion *Allium peninsulare* var. *franciscanum*	CNPS 1B.2	Perennial herb (bulbiferous)	May – Jun	Cismontane woodland, and valley and foothill grassland. Clay soils, often on serpentine, sometimes volcanics. Dry hillsides. Elevation 330 to 985 feet.	**Present:** Observed along Fifield Ridge adjacent to trail and at other locations on the watershed.
Bent-flowered fiddleneck *Amsinckia lunaris*	CNPS 1B.2	Annual herb	Mar – Jun	Cismontane woodland, coastal bluff scrub, and valley and foothill grassland. Elevation 10 to 1,640 feet.	**Moderate:** Records approximately 0.6 mile away; suitable woodland-grassland habitat present on Fifield and Cahill ridges.
Kings Mountain manzanita *Arctostaphylos regismontana*	CNPS 1B.2	Shrub (evergreen)	Jan – Apr	Broadleaved upland forest, chaparral, and north coast coniferous forest. Granitic or sandstone outcrops. Elevation 1,000 to 2,400 feet.	**Moderate:** Potentially suitable habitat along southern skyline ridge trail route; not observed in 2016 surveys for trail alignment and work area but one individual seen near S.R. 35.
Montara manzanita *Arctostaphylos montaraensis*	CNPS 1B.2	Shrub (evergreen)	Jan – Mar	Chaparral and coastal scrub. Slopes and ridges. Elevation 490 to 1,640 feet.	**Moderate:** Habitat present on southern skyline ridge trail alignment. Recorded from Montara Mountain and San Bruno Mountain in maritime chaparral or tanoak habitat.
San Francisco collinsia *Collinsia multicolor*	CNPS 1B.2	Annual herb	Mar – May	Closed-cone coniferous forest, shady coast live oak woodland, mixed evergreen forest, and coastal scrub, on decomposed shale (mudstone) mixed with humus. Elevation 100 to 820 feet.	**Moderate to high:** Suitable habitat present on Fifield and Cahill ridges.
Western leatherwood *Dirca occidentalis*	CNPS 1B.2	Shrub (deciduous)	Jan – Apr	Broadleaved upland forest, most woodland types. On brushy slopes, mesic sites; mostly in mixed evergreen and foothill woodland communities. Elevation 100 to 1,805 feet.	**Present:** Known from Fifield and Cahill ridges, also locations between Skyline segment and Old Cañada Road.
San Mateo woolly sunflower *Eriophyllum latilobum*	FE CE CNPS 1B.1	Perennial herb	May – Jun	Cismontane woodland, often on roadcuts; found on and off of serpentine. Elevation 150 to 490 feet.	**Moderate:** Known from San Mateo Creek watershed above and below Lower Crystal Springs Dam, including lower Fifield and Cahill ridges. Habitat present in vicinity of Fifield-Cahill ridge trail.
Point Reyes horkelia *marinensis*	CNPS 1B.2	Perennial herb	May -- Sep	Coastal dunes, coastal prairie, coastal scrub; sandy flats and dunes near coast; in grassland or scrub plant communities. Elevation 6 to 2,600 feet.	**Moderate:** Most records are in Marin County, but range is from Santa Cruz County to Marin; nearest records are Junipero Serra Park in San Bruno and San Andreas Reservoir valley.

TABLE 4.8-2 (CONTINUED)
SPECIAL-STATUS PLANT SPECIES PRESENT OR WITH POTENTIAL TO OCCUR IN THE PROJECT AREA

Common Name *Scientific Name*	Listing Status	Life Form	Flowering Period	Habitat Conditions	Potential to Occur
Arcuate bush mallow *Malacothamnus arcuatus* (or *M. fasciculatus)*	CNPS 1B.2	Shrub (evergreen)	Apr – Sept	Chaparral or coastal scrub on gravelly alluvium. Most often in disturbed areas. May be fire dependent for germination. Elevation 260 to 1,165 feet.	**Moderate to high:** Suitable chaparral habitat present. Known from several small colonies at edge of Crystal Springs Reservoir and San Andreas Lake.
Woodland woollythreads *Monolopia gracilens*	CNPS 1B.2	Annual herb	Mar – Jul	Chaparral, valley and foothill grassland, cismontane woodland, broadleaved upland forest, North Coast coniferous forest; grassy sites, in openings; sandy to rocky soils. Often seen on serpentine after burns. Elevation 330 to 4,000 feet.	**Moderate to high:** Suitable habitat present and species is known from several small sites within the watershed.
White-flowered rein orchid *Piperia candida*	CNPS 1B.2	Perennial herb	May – Sep	North Coast coniferous forest, lower montane coniferous forest, broadleaved upland forest; sometimes on serpentine. Forest duff, mossy banks, rock outcrops and muskeg. Elevation 150 to 5,400 feet.	**Moderate:** Two nearby records are from Los Trancos Preserve and Portola State Park in redwood forest.
Choris' popcornflower *Plagiobothrys chorisianus* var. *chorisianus*	CNPS 1B.2	Annual herb	Mar – Jun	Chaparral, coastal scrub and coastal prairie; mesic sites. Elevation 50 to 330 feet.	**Moderate:** Suitable moist habitat may be present on Fifield Ridge.
Coastal triquetrella *californica*	CNPS 1B.2	Moss	N/A	Coastal bluff scrub, coastal scrub; grows near the coast in open gravels on roadsides, hillsides, rocky slopes, and fields. On gravel or thin soil over outcrops. Elevation 30 to 330 feet.	**Moderate to high:** Collection records reported from Sweeney Ridge and San Bruno Mountain.

CODES

FE: Federally listed as Endangered
CE: State of California listed as Endangered
CNPS = California Native Plant Society rank
CNDDB = California Natural Diversity Database
1B: Rare, Threatened, or Endangered in California and elsewhere
2: Rare, Threatened, or Endangered in California, but more common elsewhere

POTENTIAL TO OCCUR

Moderate = Marginal habitat present in the project area and/or some occurrences in the region.
High = Good habitat present in the project area and/or nearby occurrences.
Present = Species is known to occur in the project area based on California Natural Diversity Database occurrences or recent field surveys.

SOURCES: California Natural Diversity Database, 2017; California Native Plant Society, 2017; U.S. Fish and Wildlife Service, 2017; AECOM, 2017; SFPUC, 2017; Consortium of California Herbaria, 2017.

TABLE 4.8-3
SPECIAL-STATUS WILDLIFE SPECIES PRESENT, OR WITH POTENTIAL TO OCCUR, IN THE PROJECT AREA

Common Name ***Scientific Name***	**Status**	**Habitat**	**Potential to Occur**
INVERTEBRATES			
San Bruno elfin butterfly *Callophrys mossii bayensis*	FE	Coastal, mountainous areas with grassy ground cover, mainly in the vicinity of San Bruno Mountain, San Mateo County. Colonies are located on steep, north-facing slopes within the fog belt. Larval host plant is *Sedum spathulifolium*.	**Present:** Known locality of *Sedum spathulifolium* and butterfly species is present along Fifield Ridge portion of project area.
Mission blue butterfly *Plebejus =Icaricia, Aricia icarioides missionensis*	FE	Inhabits coastal scrub in scattered localities in San Francisco, San Mateo and Marin counties. Three larval host plants: *Lupinus albifrons* var. *collinus*, *L. variicolor*, and *L. formosus*, of which *L. albifrons* is favored.	**Present:** Colonies of host plants, larvae, and adult butterflies observed at several areas in the northern portion of the watershed, including within the service road on Fifield Ridge.
Callippe silverspot butterfly *Speyeria callippe*	FE	Restricted to northern coastal scrub and nearby grasslands of peninsulas and Mateo and Alameda counties; host plant is *Viola pedunculata*. Most adults found on east-facing slopes; males congregate on hilltops in search of females.	**Low:** Northern coastal scrub and grassland habitat containing host plants is present in low quantities in the project area, mainly on Fifield Ridge.
AMPHIBIANS			
Santa Cruz black salamander *Aneides niger*	CSC	Mixed deciduous and coniferous woodlands and coastal grasslands in San Mateo, Santa Cruz and Santa Clara counties; adults found under rocks, talus and damp woody debris.	**Moderate:** Nearest known record is about 2 miles southeast of project area and suitable habitat is present in project area.
California giant salamander *Dicamptodon ensatus*	CSC	Aquatic, meadow and seep. North Coast coniferous forest, riparian forests; aquatic larvae found in cold, clear streams, occasionally in lakes and ponds. Adults known from wet forests under rocks and logs near streams and lakes.	**Present:** Recorded less than 1 mile from the Fifield and Cahill ridges portion of project area.
California red-legged frog *Rana draytonii*	FT, CSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11–20 weeks of permanent water for larval development; must have access to aestivation (summer dormancy) habitat. Adults may move considerable distance between breeding and estivation habitat.	**Present:** Observed less than 1 mile from the Fifield and Cahill ridges portion of project area.
REPTILES			
Western pond turtle *Actinemys marmorata*	CSC	Found in ponds, marshes, rivers, streams, and irrigation ditches with aquatic vegetation. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat for egg-laying.	**Moderate:** Known from many records throughout the watershed; suitable habitat is present in aquatic habitat adjacent to the project area.
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	FE, CE, FPS	Vicinity of freshwater marshes, ponds, and slow-moving streams in San Mateo County and extreme northern Santa Cruz County. Prefers dense cover and water depths of at least 1 foot. Upland areas near water also very important.	**Present:** Known to occur in the project area on the Fifield and Cahill ridges portion of the project; an incidental observation was made in the southern skyline ridge trail alignment area as well.

TABLE 4.8-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES PRESENT, OR WITH POTENTIAL TO OCCUR, IN THE PROJECT AREA

Common Name ***Scientific Name***	**Status**	**Habitat**	**Potential to Occur**
BIRDS			
Cooper's hawk *Accipiter cooperii*	WL	Appears in most wooded areas of the state. Requires dense stands of live oak, riparian deciduous, or other forest habitats near water when nesting. Increasingly found breeding in residential neighborhoods. Preys on medium-sized birds and small mammals.	**Present:** Project area contains suitable nesting habitat and foraging resources; reported from several localities within the project area.
Marbled murrelet *Brachyramphus marmoratus*	FT, CE	(Nesting) Feeds near shore on fish; nests along coast in California from Half Moon Bay to Santa Cruz and from Eureka to the Oregon border. Nests high in old-growth redwood-dominated forests, to over 50 miles inland, often in Douglas firs. Requires large diameter (greater than 30 centimeters) limbs or naturally occurring platforms with collection of pine needles, moss, or duff to serve as nests.	**High:** The project area crosses U.S. Fish and Wildlife Service-designated critical habitat; occupied nesting habitat is located approximately 0.4 mile from the Fifield-Cahill ridge trail along Pilarcitos Creek near Stone Dam Reservoir and suitable nesting habitat overlaps the trail.
Vaux's swift *Chaetura vauxi*	CSC	(Nesting) Natural cavities with vertical entranceways, such as hollow trees. (Foraging) Open sky over woodlands, lakes, and rivers where flying insects are abundant. Nesting habitat is forest, either coniferous or mixed, but primarily old-growth trees with snags for nesting and roosting.	**Present:** Observed in watershed; suitable nesting and foraging habitat present on both Fifield-Cahill ridge trail and southern skyline ridge trail portions of project area; species observed at Sweeney Ridge, Skylawn Memorial Park, near Skyline Quarry.
Northern harrier *Circus cyaneus*	CSC	(Nesting) Coastal scrub, valley and foothill grassland, riparian scrub, wetlands, and other habitats. Nests on ground in shrubby vegetation, usually at marsh edge; forages in grasslands for small mammals by flying low over the landscape, using hearing as well as sight to hunt.	**Moderate:** Known to occur in the watershed. Foraging habitat is marginal along the southern skyline ridge trail. Suitable foraging habitat is present south of the proposed universal access loop trail on the Fifield-Cahill ridge trail. No suitable nesting habitat in the project area. Nearest records are from Bair Island, Union City in salt marsh.
Olive-sided flycatcher *Contopus cooperi*	CSC	Breeds in montane coniferous forests, at forest edges and openings, such as meadows and ponds. Winters at forest edges and clearings where tall trees or snags are present.	**High:** Known to occur in the watershed, observed at Skylawn Memorial Park and at Purisima Creek Redwoods Preserve along S.R. 35. Suitable nesting habitat is present in Douglas firs and other conifers.
White-tailed kite *Elanus leucurus*	CFP	Breeds in California's Central Valley, along entire length of coast and in Imperial Valley. Nests in wide variety of trees that are 3 to 50 meters tall on habitat edges. Forages for small mammals in undisturbed, open grasslands, meadows, farmlands, and emergent wetlands by kiting.	**Moderate:** Known to occur in the watershed. Foraging habitat is marginal along the southern skyline ridge trail. Suitable foraging habitat is present south of the proposed universal access loop trail on the Fifield-Cahill ridge trail. Potential nesting trees present along Fifield and Cahill ridges portion of project area.
Merlin *Falco columbarius*	CSC	A winter migrant in California. This species winters in a variety of habitats from the coast to grasslands, savannahs, woodlands, and open forests in the mountains, but it prefers open habitats near water.	**High:** Known to winter in watershed; does not nest/breed in California.

TABLE 4.8-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES PRESENT, OR WITH POTENTIAL TO OCCUR, IN THE PROJECT AREA

Common Name ***Scientific Name***	**Status**	**Habitat**	**Potential to Occur**
BIRDS (cont.)			
American peregrine falcon *Falco peregrinus anatum*	FD, CD, CFP	(Nesting) Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape on a depression or ledge in an open site.	**High:** Nesting pair documented in recent years less than 1 mile from project area; suitable foraging resources are present in the project area.
Bald eagle *Haliaeetus leucocephalus*	FD, CE, CFP	(Nesting and wintering) Ocean shore, lake margins, and rivers for both nesting and wintering. Most nest within 1 mile of water. Roosts communally in winter. Nests in large, old-growth, or dominant live trees with open branches, especially ponderosa pine.	**Moderate (nesting):** Nests in the watershed less than 1.5 miles from Fifield and Cahill ridges portion of project area. Nesting habitat is present in the project area, but is probably too far from water to be preferred.
Purple martin *Progne subis*	CSC	Inhabits woodlands, low-elevation coniferous forest of Douglas fir, ponderosa pine, and Monterey pine. Nests mostly in old woodpecker cavities, but also human-made structures. Nests are often located in a tall, isolated tree or snag.	**Present:** Reported from Fifield-Cahill ridge road, Sawyer Ridge Road, Skylawn Memorial Park, and along southern skyline ridge trail route. Reported as nesting on Sweeney Ridge.
MAMMALS			
Townsend's big-eared bat *Corynorhinus townsendii*	CSC	Humid coastal regions of northern and central California. Roosts in limestone caves, lava tubes, mines, buildings, etc. Will only roost in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to disturbance.	**Moderate:** Anthropogenic structures may serve as roosting habitat. Abundant foraging habitat is present in the project area.
Hoary bat *Lasiurus cinereus*	SA	Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest; roosts in dense foliage of medium to large trees. Feeds primarily on moths; required open water. Prefers open habitats and habitat mosaics with access to trees for cover and open areas or habitat edges for feeding.	**High:** Many records of species both north and south of project area; suitable habitat present in wooded portions of Fifield-Cahill ridge trail and southern skyline ridge trail alignment areas.
Fringed myotis *Myotis thysanodes*	SA	Occupies a wide variety of habitats, including valley foothill hardwood and hardwood-conifer. Uses caves, mines, buildings, or crevices for maternity colonies and roosts.	**High:** Recorded between Crystal Springs Reservoir and S.R. 35; suitable hardwood-conifer forest is extensive in project area, especially S.R. 35 portion.
San Francisco dusky-footed woodrat *Neotoma fuscipes annectens*	CSC	Forest habitats of moderate canopy and moderate to dense understory. May prefer chaparral and redwood habitats. Constructs nests of shredded grass, leaves, and other material. May be limited by availability of nest-building materials.	**High:** Woodrat nests observed throughout wooded and scrub habitats in watershed; suitable habitat is extensive in most parts of project area.
American badger *Taxidea taxus*	CSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils. Needs sufficient food, friable soils, and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**Moderate:** One known occurrence near the southern portion of the project area. Suitable open habitat is found elsewhere throughout the project area.

TABLE 4.8-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES PRESENT, OR WITH POTENTIAL TO OCCUR, IN THE PROJECT AREA

CODES

FE: Federally Endangered
FT: Federally listed as Threatened
FD: Federal Delisted
CD: State of California Delisted
CE: State of California Endangered
CSC: California Species of Special Concern
FPS: California Fully Protected Species
CFP: State of California Fully Protected Species
CNDDB = California Natural Diversity Database
SA: California Department of Fish and Wildlife Special Animal; not considered special-status under CEQA analysis
WL: Watch List

POTENTIAL TO OCCUR

Species considered absent or with low potential to occur are included in Appendix C.
Moderate = Marginal habitat present in the project area and/or some occurrences in the region.
High = Good habitat present in the project area and/or nearby occurrences.
Present = Species is known to occur in the project area based on California Natural Diversity Database occurrences or recent field surveys.

SOURCES: California Department of Fish and Wildlife, 2017; U.S. Fish and Wildlife Service, 2017; Mayer & Laudenslayer, 1988; Zeiner et al., 1990a and 1990b.

Special-Status Plant and Animal Species

Tables 4.8-2 and 4.8-3 identify special-status plant and animal species that are present or have a moderate to high potential to occur within the project area and present summaries of these species' habitats. Appendix C provides more detailed descriptions for selected species and contains a table showing all species with the potential to occur, including low-potential and absent species. The resources consulted by the project biologists and the bases for their determinations regarding special-status species' potential to occur are summarized below.

The lists of special-status plants and animals presented herein were obtained from queries of the California Natural Diversity Database, the California Native Plant Society Electronic Inventory, and the U.S. Fish and Wildlife Service Information for Planning and Conservation.[78,79] Queries were based on the project footprint and an 11-quadrangle area consisting of the three-quad area in which the project is proposed, plus eight adjacent quadrangles.[80,81,82]

Annual surveys of San Bruno elfin and Mission blue butterfly were changed from host plant monitoring to population monitoring in 2014 and has continued through 2019. Annual population monitoring would continue in the future regardless of whether the project is implemented.[83] In 2012, the U.S. Fish and Wildlife Service agreed that the SFPUC would discontinue the quantitative annual monitoring of abundance and cover of larval food plants, but that a qualified entomologist would continue annually inspecting the larval host plants on the Fifield-Cahill ridge trail throughout the adult flight season for San Bruno Elfin and Mission Blue butterfly for evidence of trampling or other damage related to trail use related. The qualified entomologist also annually monitors adult, egg, and larval life stages on Fifield Ridge Road as well as other nearby non-trail roads, such as Pilarcitos, Whiting Ridge, and Spring Valley roads, for comparison to Fifield Ridge. This monitoring program focuses on qualitative observations relevant to detecting impacts related to trail use. While none has been observed, any impacts associated with trail use would trigger the SPFUC to reevaluate the trail use program in consultation with the regulatory agencies.[84]

Although comprehensive rare plant surveys have not been performed for the project, rare plant surveys were conducted in 2015 and 2016 for the portion of the project area south of S.R. 92,

78 California Natural Diversity Database and California Native Plant Society queries also include some California Native Plant Society rank 3 and 4 species. San Francisco Planning Department policy does not consider these species to have special status, and impacts on these species are not necessarily considered significant.

79 U.S. Fish and Wildlife Service, *Resource List of Federal Endangered and Threatened Species that Occur in or may be Affected by the Southern Skyline Boulevard Ridge Trail Extension Project*, accessed January 12 2017.

80 California Department of Fish and Wildlife, California Natural Diversity Database, accessed January 12, 2017.

81 California Native Plant Society, *Rare Plant Program*, *http://www.rareplants.cnps.org*, accessed January 13, 2017.

82 U.S. Fish and Wildlife Service, *Resource List of Federal Endangered and Threatened Species that Occur in or may be Affected by the Southern Skyline Boulevard Ridge Trail Extension Project*, accessed January 12, 2017.

83 Arnold, Richard A., *Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, December 2016.

84 Thomas, Mike, U.S. Fish and Wildlife Service, email correspondence with Joseph Terry, U.S. Fish and Wildlife Service, June 7, 2012.

except for the fencing installation area.[85,86] The surveys note the presence of Douglas fir and coast redwood forest habitat types, coyote brush scrub, managed fuelbreak vegetation, non-native-dominated vegetation, and developed habitat. The surveys do not indicate that special-status plant species were observed in the surveyed areas, although the Natural Environment Study notes suitable habitat is present.[87] These survey results have been incorporated in this analysis.

Annually, the SFPUC conducts pre-mowing plant surveys along the Fifield-Cahill ridge trail to identify, map, and flag rare plants and listed butterfly host plants.[88] Rare plants identified in these surveys are shown on Figure 4.8-2 and have been included in this analysis.

For special-status species known to occur in the project region, this evaluation considers habitat and distribution to determine which species have the potential to occur within the project area. These species were given further consideration if they met any of these criteria: the species is documented to occur within 2 miles of the project area; the Natural Environmental Study considers the species to have at least a moderate potential to occur in the project area;[89] the species is considered in the management plan EIR; or the species has habitat and distribution similar to that of the project area. This analysis provides a detailed assessment of the potential for rare plants to occur in the project area based on the information described above.

Table 4.8-2 presents information on the name, status, habitat, distribution, and flowering period and an assessment of the potential (i.e., present, high, moderate) for special-status plant species to occur in the project area. Appendix C presents a species summary for the plants with at least a moderate potential to occur in and near the project area. In addition to the references cited in these introductory paragraphs, the descriptions presented in Appendix C include references to additional locality data,[90] the Consortium of California Herbaria[91] and firsthand observations. Figure 4.8-2 presents known locations of special-status plants within a 2-mile radius of the project area based on database records.

Table 4.8-3 presents information on the name, status, habitat, and distribution and an assessment of the potential (i.e., present, high, moderate) for special-status wildlife to occur in the project area. Appendix C presents detailed information for selected wildlife with a moderate or higher potential to occur in and near the project area. Figure 4.8-3 presents a map of special-status species occurrences within 2 miles of the project area based on diversity database records, and Figure 4.8-4 shows designated critical habitats in and near the project area.

85 Simono, Scott, *The Proposed Southern Skyline Boulevard Bay Area Ridge Trail Extension and Skylawn Staging Area: Surveys for Special-Status Plants along the Proposed Trail Route on San Francisco Public Utilities Peninsula Watershed Lands*, memo to file dated July 21, 2015, 11 pp.

86 AECOM, *Draft Natural Environment Study*, July 2017.

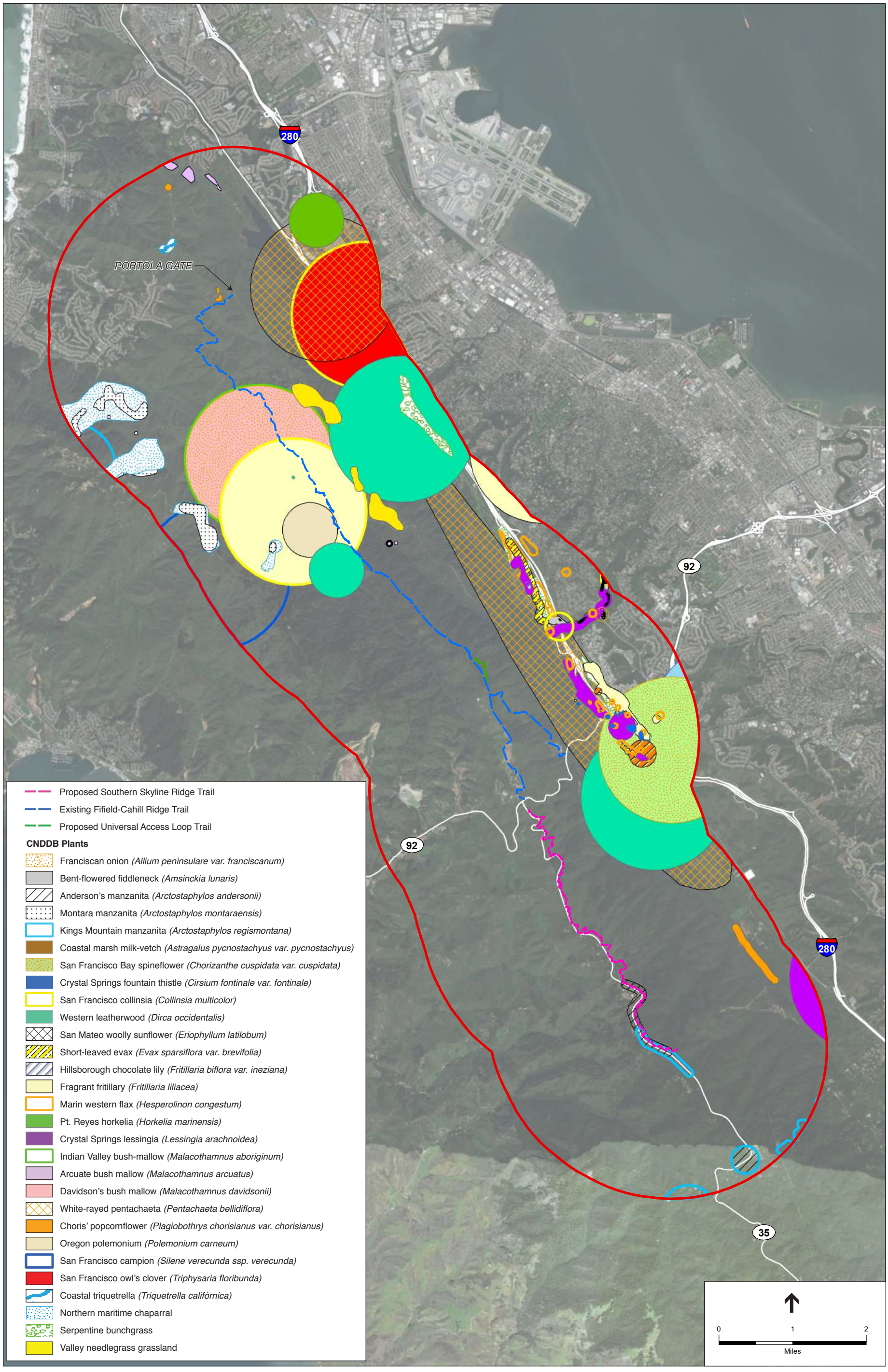
87 Simono, Scott, *The Proposed Southern Skyline Boulevard Bay Area Ridge Trail Extension and Skylawn Staging Area: Surveys for Special-Status Plants along the Proposed Trail Route on San Francisco Public Utilities Peninsula Watershed Lands*, memo to file dated July 21, 2015, 11 pp.

88 San Francisco Public Utilities Commission, Natural Resources Survey Reports: 4/12/16, 4/13/16, 4/15/16, 4/16/16, 5/10/16, 5/11/16, 5/13/16, 5/23/16, 5/26/16, 5/27/16, 5/31/16, 6/1/16, 6/2/16, 6/6/16, and 6/10/16, 2016.

89 AECOM, *Draft Natural Environment Study*, July 2017.

90 SFPUC, Natural Resources Division, *Geographic Information System Database for Peninsula Watershed – Rare Plants,* 2017.

91 Consortium of California Herbaria occurrence records for San Mateo species, *http://ucjeps.berkeley.edu/consortium/*, San Mateo County search, accessed on various dates, January 12 through April 10, 2017.

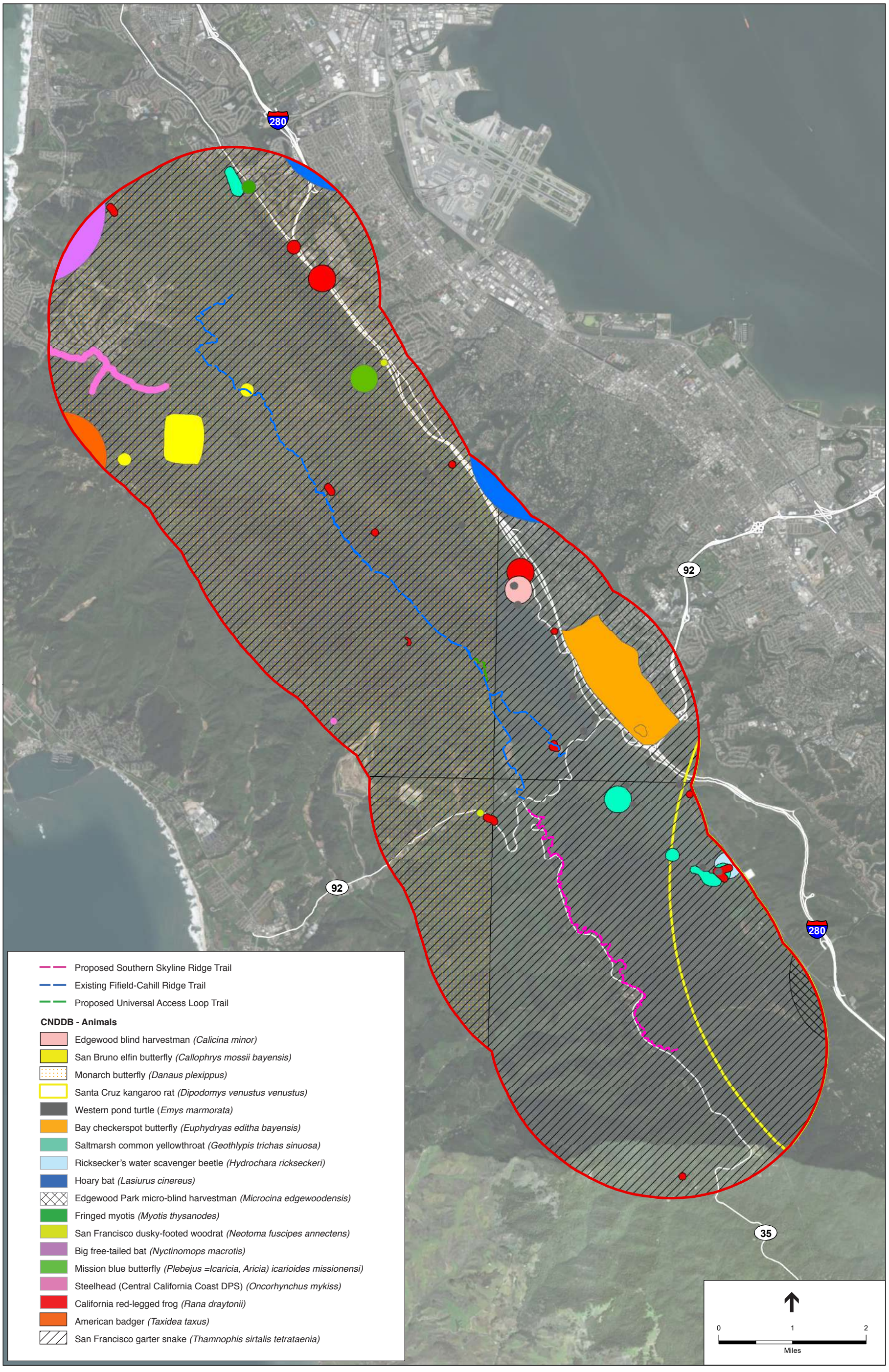


SOURCE: CNDDB, 2017

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.8-2

Special Status Plants Within Two Miles of Project Area (CNDDB)

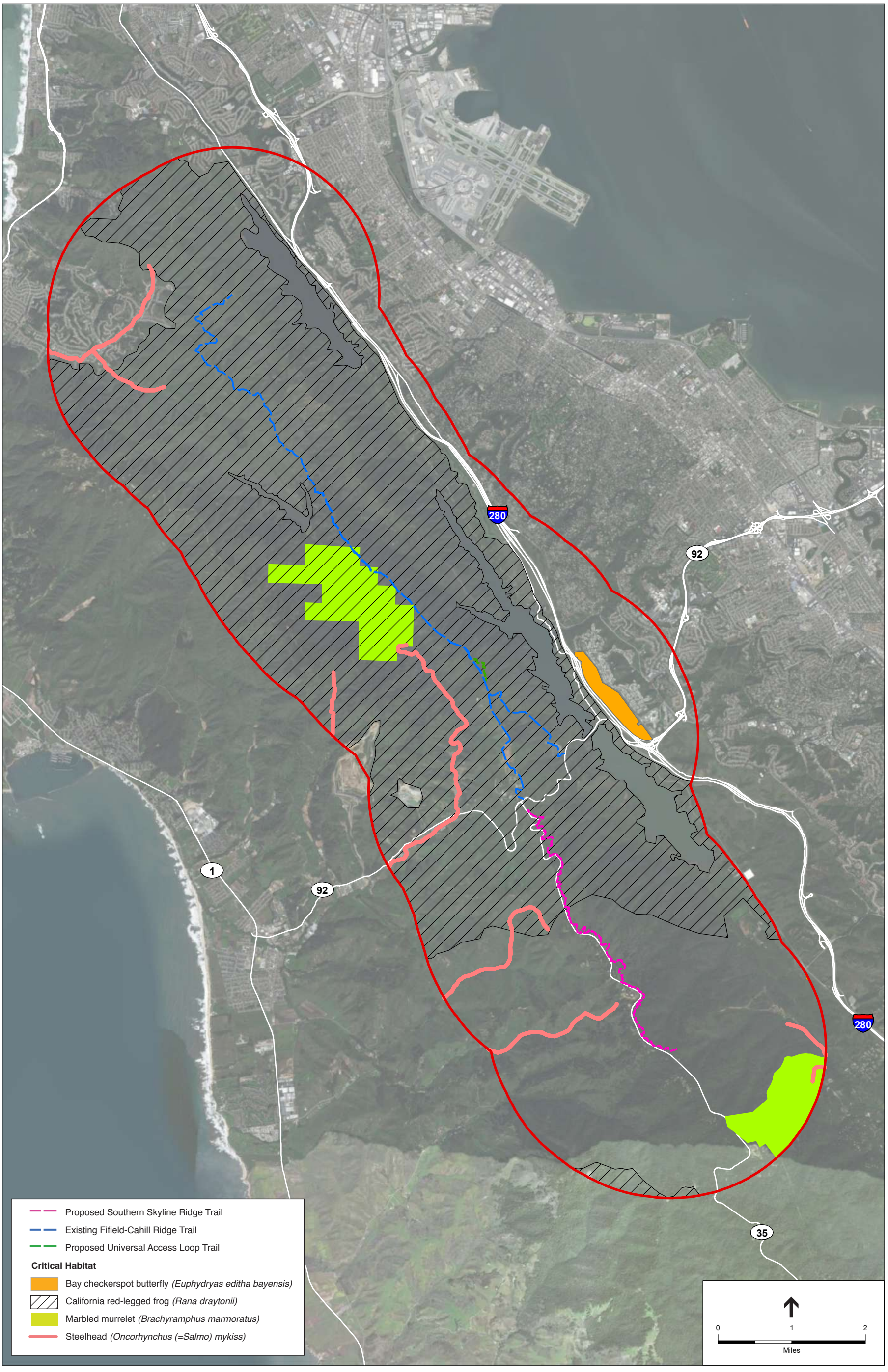


SOURCE: CNDDB, 2017

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.8-3

Special Status Wildlife Within Two Miles of Project Area (CNDDB)



SOURCE: USFWS, 2017

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.8-4

Critical Habitat within the Watershed

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4.8.3 Regulatory Framework

4.8.3.1 Federal Regulations

Endangered Species Act

The Federal Endangered Species Act, which is administered by U.S. Fish and Wildlife Service and National Marine Fisheries Service, protects fish, plants, and wildlife species identified by these agencies as threatened or endangered, as well as the habitats of identified species. In general, the fisheries service is responsible for the protection of federally listed marine species and *anadromous fish*,[92] whereas the fish and wildlife service has jurisdiction over federally listed wildlife, plant, and freshwater fish species.

Endangered refers to species, subspecies, or distinct population segments that are in danger of extinction throughout all or a significant portion of their range.

Threatened refers to species, subspecies, or distinct population segments that are likely to become endangered in the near future.

Take is defined in the Federal Endangered Species Act as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."

The take of listed species can be authorized through either the section 7 consultation process for actions undertaken by federal agencies, or through the section 10 permit process for actions undertaken by non-federal agencies where there is no federal agency action, such as issuance of a U.S. Army Corps of Engineers Clean Water Act section 404 permit, or issuance of federal agency funding.

Federally protected species with the potential to occur in the project area include San Bruno elfin butterfly, Mission blue butterfly, San Francisco garter snake, California red-legged frog, and marbled murrelet (no nesting habitat).

Migratory Bird Treaty Act

The Federal Migratory Bird Treaty Act authorizes the U.S. Secretary of the Interior to protect and regulate the taking of migratory birds. It establishes seasons and bag limits for hunted species and protects migratory birds, their occupied nests, and their eggs. Most actions that result in taking or in permanent or temporary possession of a protected species constitute violations of the act. Examples of permitted actions that do not violate the act are the possession of a hunting license to pursue specific gamebirds, legitimate research activities, display in zoological gardens, bird-banding, and other similar activities. The U.S. Fish and Wildlife Service is responsible for overseeing compliance with the act, and the U.S. Department of Agriculture's animal damage control officer makes recommendations on related animal protection issues.

[92] Anadromous fish are born in freshwater then migrate to the ocean as juveniles, where they grow into adults before migrating back into freshwater to spawn.

Bald and Golden Eagle Protection Act

The federal Bald and Golden Eagle Protection Act of 1940 protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this act. The take of bald and golden eagles includes to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."[93] Disturb means to agitate or bother a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.[94]

Clean Water Act Section 404

The federal Clean Water Act was enacted as an amendment to the federal Water Pollution Control Act of 1972, which outlines the basic structure for regulating discharges of pollutants to *waters of the United States*. The act serves as the primary federal law protecting the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands.

Waters of the United States are areas subject to federal jurisdiction pursuant to section 404 of the act. Waters of the United States are typically divided into two types: (1) wetlands and (2) other waters of the United States. *Wetlands* are "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."[95] To be considered subject to federal jurisdiction, a wetland must normally support *hydrophytic vegetation* (plants growing in water or wet soils), hydric soils, and wetland hydrology.[96] Other waters of the United States are seasonal or perennial water bodies, including lakes, stream channels, drainages, ponds, and other surface water features, that exhibit an ordinary high-water mark but lack positive indicators for the three wetland parameters.

Clean Water Act section 404 regulates the discharge of dredged and fill materials into waters of the United States. Applicants must obtain a permit from the army corps for discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. The project would not result in the discharge of dredged or fill material into federally jurisdictional waters; therefore, a section 404 permit would not be needed.

Water Quality Certification (Clean Water Act Section 401)

Under Clean Water Act section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over affected waters at the point where

93 16 United States Code, section 668c.
94 72 Code of Federal Regulation section 31132; 50 Code of Federal Regulations 22.3.
95 33 Code of Federal Regulations section 328.3[b], 40 Code of Federal Regulations section 230.3.
96 Environmental Laboratory, *Corps of Engineers Wetland Delineation Manual*, Final Report, Department of the Army Waterways Experiment Station, Vicksburg, Mississippi, January 1987.

the discharge would originate. The California Regional Water Quality Control Board administers this certification. Therefore, all projects that have a federal component and that may affect state water quality (including projects that require federal agency approval, such as issuance of a section 404 permit) must also comply with section 401.

4.8.3.2 State Regulations

California Endangered Species Act

The California Endangered Species Act, which is administered by California Department of Fish and Wildlife, prohibits the take of plant and animal species designated by the Fish and Game Commission as either threatened or endangered in California. *Take* in the context of the California Endangered Species Act means "to hunt, pursue, kill, or capture" a listed species, as well as any other actions that may result in adverse impacts when attempting to take individuals of a listed species. The take prohibitions also apply to candidates for listing under the act. Section 2081 of the act allows the department to authorize exceptions to the state's prohibition against the take of a listed species, such as for educational, scientific, or management purposes, with the exception of *fully protected species* (see below). Species protected by the act with the potential to occur in or near the project area include, but are not limited to, San Francisco garter snake, bald eagle, and marbled murrelet.

California Fish and Game Code

Fully Protected Species

California Fish and Game Code section 2080 provides protection from take for a variety of species, referred to as fully protected species. Except for take related to scientific research, all take of fully protected species is prohibited. Fully protected wildlife species that have the potential to occur in the project area include San Francisco garter snake, peregrine falcon, bald eagle, and white-tailed kite.

Streambed Alteration Agreements

Under California Fish and Game Code section 1602 et seq., the California Department of Fish and Wildlife has jurisdictional authority over resources associated with rivers, streams, and lakes. The department can regulate all work under the jurisdiction of California that would: substantially divert, obstruct, or change the natural flow of a river, stream, or lake; substantially change the bed, channel, or bank of a river, stream, or lake; or use material from a streambed. If the department determines a project would result in substantial adverse effects on an existing fish or wildlife resource within such areas, it would prepare a "lake or streambed alteration agreement" that includes reasonable measures to protect the resources. The lake or streambed alteration agreement is not a permit, but rather a mutual agreement between the department and the applicant.

Bird/Raptor Protections in the Fish and Game Code

Section 3503 of the California Fish and Game Code prohibits take, possession, or destruction of the eggs and nests of all birds. Section 3503.5 prohibits the take of raptor species and the destruction of raptor nests. Take or possession of any migratory, non-game bird as designated in the Federal Migratory Bird Treaty Act is prohibited under sections 3513 and 3800.

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) established the State Water Resources Control Board and divided the state into nine basins, each with its own regional board. The Porter-Cologne Act authorizes the state board to enact state policies regarding the protection of *waters of the state*, broadly defined as "any surface water or groundwater, including saline waters, within the boundaries of the state"[97] including isolated, intrastate, and non-navigable waters and/or wetlands. With respect to biological resources, the state board and regional boards have authority over any fill activities within state waters, including isolated water/wetlands that may be outside the jurisdiction of the army corps.

California Forest Practices Act

The California Forest Practices Act of 1973 requires sponsors of forestry operations to prepare and obtain approval for a timber harvest plan. Exceptions allow for limited tree removal for vegetation maintenance, fuelbreaks, and road maintenance. Projects that would convert less than 3 acres of forest to non-forest are exempt from preparing a timber harvest plan.

4.8.3.3 Local Plans and Policies

San Mateo County's Significant Tree Ordinance (Ordinance No. 3229, as amended) protects *significant trees* (defined as woody plants exceeding a qualifying size) from premature removal. The ordinance applies to public property, which it defines as including "all property owned by the County of San Mateo, any other city, county, city and county, special district or other public agency in the unincorporated area of San Mateo County" (section 12.014). Per the ordinance, significant trees include coast live oak, California bay, coast redwood, madrone, Douglas fir, and tanoak. The County has designated the Peninsula Watershed as a resource management district. The Significant Tree Ordinance exempts tree cutting on properties in a designated resource management district, such as the Peninsula Watershed, except within 100 feet of a state or county scenic road, such as S.R. 35. The Heritage Tree Ordinance (Ordinance No. 2427) regulates the trimming and removal of trees of a specified type and size on private and some public property. However, the ordinance only applies to public properties owned by a public entity that is controlled or regulated by San Mateo County (section 11,050(j)).[98] The City and County of San Francisco, which owns the Peninsula Watershed, is not controlled or regulated by San Mateo County.

[97] California Water Code section 13050.

[98] San Mateo County Ordinances (part e, division VIII of the Ordinance Code, and Ordinance No. 2427), *https://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/Significant%20Tree%20Ordinance.pdf*, accessed June 20, 2018.

4.8.4 Impacts and Mitigation Measures

4.8.4.1 Significance Criteria

The project would have a significant impact related to biological resources if it were to:

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

4.8.4.2 Approach to Analysis

Criteria Not Analyzed

The impact analysis does not further evaluate the following significance criteria for the reasons described below:

- ***Conflict with local policies or ordinances protecting terrestrial biological resources, such as a tree preservation policy or ordinance during project operations.*** Project operations would not require the removal of trees, except where tree removal is necessary to protect public safety (e.g., to remove fall and fire hazards). Tree removal for the purpose of eliminating hazards to life and property is exempt from the San Mateo County Significant Tree Ordinance (section 12,020.1[c]).[99] As noted in Section 5.1.8.3, Local Plans and Policies, the Heritage Tree Ordinance does not apply to the project. Thus, project operations would not conflict with local ordinances protecting terrestrial resources. This criterion is discussed further for project construction.
- ***Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other adopted local, regional, or state habitat conservation plan.*** There are no adopted habitat conservation plans, natural community conservation plans, or other

[99] Ibid.

approved habitat conservation plans that apply to the project area. Thus, this criterion is not applicable to construction or operation of the project and is not discussed further.

Project Impacts

Impacts could result from construction or operation of the project. This analysis separates the discussion of construction and operational impacts when the impacts would differ among the proposed access program and/or variants 1, 2, or 3 or within different geographic areas (e.g., Fifield-Cahill ridge trail or southern skyline ridge trail). For each access program under consideration, the analysis addresses potential impacts on special-status species, sensitive natural communities, wetlands, and wildlife corridors.

Construction Impacts

Construction-related effects on biological resources are direct or indirect impacts that could occur during construction, including excavation and earthmoving activities. These generally include trampling or injury by humans or machinery; habitat destruction or disturbance causing habitat abandonment; nest abandonment; or reproductive failure. Indirect effects occur later in time and could include increased invasive species, hydrological changes that reduce habitat quality, or increase competition or predation, among other potential adverse effects on biological resources.

Operational Impacts

Operational impacts are associated with the long-term operation of the proposed trails, parking lots, and ancillary features, including impacts from recreational use. The operational baseline condition is the current program of docent-led visitation along Fifield-Cahill ridge trail and no visitation from the public along the southern skyline ridge trail alignment. In addition to public use, as explained in Chapter 2, Project Description, Section 2.7.2.2, *Vegetation Maintenance*, watershed staff regularly transit the Fifield-Cahill ridge trail for operations and maintenance, annually mow the road shoulder areas to reduce ignitable fuels, and periodically mow or masticate the vegetated fuelbreak network to reduce fuels where roadways are co-located with fuelbreaks. As also noted in that section, vegetation management includes applying herbicide, hydroseeding, seeding, and planting propagules.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of the potential cumulative projects near the project area. The cumulative analysis for biological resources impacts uses a list-based approach to analyze the effects of the project in combination with the effects of past, present, and probable future projects in the immediate vicinity. The cumulative analysis considers whether there would be a significant, adverse cumulative impact associated with project implementation in combination with other projects in the cumulative scenario, 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 it is deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.8.4.3 Impact Summary

Table 4.8-4 summarizes the impacts of the project related to biological resources. The impact summary table provides separate significance determinations for the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail), variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). Table 4.8-5 presents a summary of the mitigation measures that apply to the proposed access program and each of the variants.

TABLE 4.8-4
SUMMARY OF IMPACTS – BIOLOGICAL RESOURCES

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact BI-1: Construction of the project could result in substantial adverse impacts on special-status plants.	LSM	LSM	LSM	LSM
Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife.	LSM	LSM	LSM	LSM
Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands.	LSM	LSM	LSM	LSM
Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants.	LS	LS	LSM	LSM
Impact BI-5: Project operations could result in substantial adverse impacts on special-status wildlife.	LSM	LSM	SUM	SUM
Impact BI-6: The project would not result in operational impacts on sensitive natural communities, including riparian habitat and wetlands.	LS	LS	LS	LS
Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens.	SUM	LSM	SUM	SUM
Impact BI-8: Construction of the project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	LS	LS	LS	LS
Impact C-BI-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on biological resources.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation
SUM = Significant and Unavoidable impact with implementation of feasible Mitigation

TABLE 4.8-5
SUMMARY OF MITIGATION MEASURES BY ACCESS PROGRAM

Mitigation Measure	Fifield-Cahill Ridge Trail				Southern Skyline Ridge Trail	
	Proposed Access Program	Access Program Variant 1 (Docent Program)	Access Program Variant 2 (Unsupervised/ Unrestricted Access)	Access Program Variant 3 (Unsupervised/ Restricted Access)	Proposed Access Program and Variants 2 and 3	Access Program Variant 1 (Docent Program)
M-BI-1a – Avoidance Measures for Special-Status Plant Species	X	X	X	X	X	X
M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat	X	X	X	X	X	X
M-BI-1c – Revegetation Plan	X	X	X	X	X	X
M-BI-1d – Worker Environmental Training	X	X	X	X	X	X
M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians	X	X	X	X	X	X
M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species	X	X	X	X		
M-BI-2c – Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger	X	X	X	X	X	X
M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species	X	X	X	X	X	X
M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts	X	X	X	X	X	X
M-BI-3 – Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities			X	X	X	X
M-BI-4 – Operational Measures to Protect Sensitive Plant Species			X	X	X	
M-BI-5a – Protection of Special-Status Wildlife during Operations			X	X	X	
M-BI-5b – Additional Biological Protections for Unsupervised Access			X	X	X	
M-BI-5c – Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians			X	X		
M-BI-7a – Measures to Reduce Spread of Invasive Plants	X	X	X	X	X	X
M-BI-7b – Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death)	X	X	X	X	X	X
M-BI-7c – Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens			X	X	X	

4.8.4.4 Impact Analysis

This section presents the biological resources impact analysis for the project. The section includes a separate discussion of potential effects for each of the eight impacts categories identified in Table 4.8-4 (e.g., impact BI-1, Impact BI-2, etc.). For each category, or Impact, the analysis considers the potential effects of implementing the proposed access program, variant 1, variant 2, and variant 3. Each Impact discussion concludes with a summary of the potential effects identified for the proposed access program.

Analysis of Construction Impacts on Special-status Plants and Animals, and Sensitive Natural Communities

Impact BI-1: Construction of the project could result in substantial adverse impacts on special-status plants. (Less than Significant with Mitigation)

The management plan EIR considers the potential effects of construction on special-status plants on a project basis for the Fifield-Cahill ridge trail and on a programmatic basis for the southern skyline ridge trail. The document concludes that the potential effects of construction could be significant and recommends Program-Level Mitigation Measures E.1 and E.2 and Project-Level Mitigation Measures E.1 through E.3 to reduce those impacts.[100] The measures call for actions including preconstruction surveys, avoidance of sensitive habitat areas, development of a vegetation management plan, and resource monitoring. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on special-status plants and of the efficacy of the previously identified mitigation. Accordingly, this EIR updates and refines the management plan EIR mitigation measures based on consideration of this new information and changes to the status and distribution of special-status plants. With the exception of the developed mapping unit, the habitats within the project area contain potential habitat for special-status plant species.

Fifield-Cahill Ridge Trail

Construction of project improvements north of S.R. 92, depending upon access program, could potentially affect various habitat types. For example, improvements in the vicinity of Portola and Cemetery gates in Douglas fir and oak woodland habitat could directly affect populations of special-status plants, such as white-flowered rein orchid, San Mateo woolly sunflower, bent-flowered fiddleneck, Franciscan onion, and San Francisco collinsia, if present. Construction activities affecting grassland, coyote brush scrub, and coffeeberry scrub in these areas could result in impacts on Franciscan onion, bent-flowered fiddleneck, San Francisco collinsia, western leatherwood, Point Reyes horkelia, arcuate bush mallow, woodland woollythreads, and coastal triquetrella, if present. The low-lying moist or clay soils in proposed construction areas could support Choris' popcornflower, Franciscan onion, or bent-flowered fiddleneck. As discussed in

[100] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-5 and 6 (p. III.E-28 and 32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI, Natural Resources (pp. VI-3 and VI-4).

Section 4.8.2.8, *Special-Status Species*, and Table 4.8-2, these species each have a California rare plant ranking of 1B, which denotes rarity and potential vulnerability of plant populations.

However, it is also important to note that much of the potentially affected project area is already disturbed and/or regularly used by SFPUC staff and visitors. For example, SFPUC staff drive on the Fifield-Cahill ridge trail between Cemetery Gate and Five Points approximately 3 to 5 times per day, and between Five Points and Portola Gate (at Sweeney Ridge) approximately 1 to 3 times per day. In addition, approximately 10 to 20 visitors (i.e., hikers, bicyclists, and equestrians) use the trail under the existing docent program, up to three days per week.[101,102] As discussed in Section 4.8.2.4, *Vegetation and Habitat Types*, the SFPUC annually mows watershed roads, including the Fifield-Cahill ridge trail, and maintains them (e.g., patching) every two to five years. In addition, SFPUC staff manage wildfire risk by reducing fuel loads and maintaining fuelbreaks of up to 50 feet wide throughout the watershed, including along the Fifield Ridge, north of Five Points. This work involves tree maintenance and vegetation clearing, as needed, typically on four-year intervals.[103] As explained in Chapter 2, Project Description, Section 2.7.2.2, *Vegetation Maintenance* the SFPUC would continue to conduct surveys for rare plants prior to mowing along Fifield-Cahill ridge trail, and map and flag any rare plants for avoidance.

Proposed Access Program and Access Program Variant 1

Under the proposed access program and access variant 1, the SFPUC would construct a universal access loop trail and four-car parking area (Americans with Disabilities Act-compliant) and 50-car parking lot and restroom near Cemetery Gate. The SFPUC would also repair and extend existing watershed boundary fencing at Cemetery and Portola gates. Surveys were negative for special-status plants in the proposed 50-car parking and restroom area. SFPUC botanists surveyed this area in 2015 using standard early-, mid-, and late-season rare plant protocols, which were shortened for drought conditions present at that time.[104] Thus, no special-status plant impacts are anticipated for the 50-car parking lot and restroom. However, no protocol-level special-status plant surveys have been conducted for the universal access loop trail and four-car parking areas, construction of which would involve approximately 0.25 acre of temporary and approximately 0.5 acre of permanent ground disturbance in vegetated areas, nor have they been conducted for the substantially smaller boundary fencing improvements. Table 4.8-6 shows the acreage of temporary and permanent vegetation impacts on each natural community under the different access programs.

[101] John Fournet, Community Liaison, SFPUC, Visitor and SFPUC use Fifield-Cahill ridge trail (file note), September 4, 2019.
[102] San Francisco Public Utilities Commission, Annual Fifield-Cahill Ridge Trail Usage, August 23, 2003 Through December 31, 2017, 2017, Table: Number of Trail Participants/Docents by Event Type.
[103] John Fournet, Community Liaison, SFPUC, Vegetation maintenance along Fifield-Cahill ridge trail (file note), May 12, 2017.
[104] Simono, Scott, *The Proposed Southern Skyline Boulevard Bay Area Ridge Trail Extension and Skylawn Staging Area: Surveys for Special-Status Plants along the Proposed Trail Route on San Francisco Public Utilities Peninsula Watershed Lands*, memo to file dated July 21, 2015, 11 pp.

TABLE 4.8-6
EXTENT OF TEMPORARY AND PERMANENT VEGETATION IMPACTS, BY HABITAT TYPE (ACRES)[A]

	Proposed Access Program and Access Program Variant 1		Access Program Variants 2 and 3			All Access Programs		
	Fifield-Cahill Ridge Trail		Fifield-Cahill Ridge Trail			Southern Skyline Ridge Trail		
				Temp			Temp	
Habitat Type	Perm	Temp	Perm[c]	Other	Fencing	Perm	Other	Fencing
Grassland[b]	0	0	0	0	0.08	0	0	0
Coast live oak	0	0	0.003	0	0.03	0	0	0
Coast redwood[b]	0	0	0	0	0	0.73	3.03	0
Coffeeberry	0	0	0.02	0	0.42	0.13	0.71	0.12
Coyote brush	0.06	0.03	0.31	0.03	4.68	3.3	14.11	2.12
Developed/disturbed	0	0	0.06	0	1.01	0.07	0.04	0.01
Douglas fir	0.5	0.25	0.71	0.25	3.74	0.66	3.0	0.02
Old-growth Douglas fir/redwood[b]	0	0	0.06	0	1.19	0	0	0
Eucalyptus	0.2	0.024	0.21	0.024	0.05	0.08	0.29	0.02
Monterey cypress, Monterey pine	0	0	0	0	0	0.49	2.4	0.08
Poison-oak	0	0	0	0	0.07	0.12	0.74	0.14
Tanoak[b]	0	0	0	0	0	0.10	0.65	0
Total	**0.76**	**0.3**	**1.38**	**0.3**	**11.3**	**5.7**	**25.0**	**2.5**

NOTES:

[a] Data derived from SFPUC CAD data file SSBRTE-CEQA-LINEWORK-20180510.dwg. Fencing data for Cahill Ridge based on a 20-foot setback from trail with a 6-foot temporary impact corridor. Old-growth component derived from SFPUC, *Peninsula Watershed Old Growth Doug Fir* (map), Natural Resources and Lands Management Division, August 29, 2019.

b Asterisk indicates a sensitive natural community. Grassland includes serpentine and needlegrass grasslands, which are sensitive natural communities, as well as non-native annual grassland.

[c] There would be an additional 0.6-acre area of permanent vegetation impact on Fifield-Cahill ridge trail under access program variants 2 and 3 (1.38acres) that would not occur under the proposed access program/access program variant 1 (0.76 acres), primarily due to the additional fencing that would be installed along Fifield-Cahill ridge trail under unsupervised access (variants 2 and 3)

The proposed universal access loop trail and four-car parking area, along with Cemetery Gate boundary fencing improvements, would be constructed in Douglas fir forest near a water tank and the existing Fifield-Cahill ridge trail, which is presently traversed by docent-led groups and watershed maintenance vehicles. The Portola Gate boundary fencing improvements would be constructed along existing fence alignment in coyote brush scrub. Thus, the habitat within these areas is regularly disturbed, and the potential for rare plant populations to be discovered here is lower than in other parts of the watershed. However, given the limited site-specific surveys, the potential loss of special-status plants cannot be entirely ruled out or quantified. Therefore, this EIR concludes that universal access loop trail and parking area construction, along with watershed boundary fencing improvements under the proposed access program and variant 1, could have a significant impact on the special-status plant species listed above with potential to occur in Douglas fir forest and coyote brush scrub.

Implementation during project construction of Mitigation Measures M-BI-1a, Avoidance Measures for Special-Status Plant Species; M-BI-1b, Minimization Measures for Special-Status Plant Species and their Habitat; M-BI-1c, Revegetation Plan; and M-BI-1d, Worker Environmental Training, would reduce these impacts to a less-than-significant level by requiring surveys of project areas where the potential for presence of special-status plant species cannot be entirely ruled out; avoidance or replanting/reseeding of special-status plant individuals and populations, if present; minimization measures to reduce the project footprint; revegetation of temporarily affected habitat; and worker environmental training to identify and avoid sensitive habitat elements. M-BI-1d includes a consolidated worker environmental training program to address all sensitive biological resources and pathogens in addition to rare plants and would be implemented to mitigate other impacts identified elsewhere is this section. Impact BI-7, below, discusses the potential for invasive plant and plant pathogen impacts, and Impact BI-8 discusses the potential for impacts on protected trees.

Mitigation Measures M-BI-1a through M-BI-1d apply to construction of the universal access loop trail and four-car parking area and Cemetery Gate and Portola Gate boundary fencing improvements under the proposed access program and access program variant 1.

Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.

- Prior to initial ground-disturbing activities in the project area, a qualified botanist shall conduct a special-status plant survey in accordance with the California Department of Fish and Wildlife protocol. The survey shall cover all unsurveyed portions of the project area that might be affected by the project to identify special-status plants and sensitive natural communities.
- Surveys shall be timed to ensure detection of all potentially occurring special-status plant species. If any special-status species are found within the project footprint, the plants shall be avoided by re-routing the project component to ensure that no work would affect the special-status plant species and by establishing a no-disturbance buffer around the species. The fence shall be located away from any identified special-status plant population. If special-status plant populations are found along the Fifield and Cahill service roads, the SFPUC shall install signage and protective fencing (such as split rail) to protect the population during construction.
- If avoidance of special-status plants is not feasible, other options as recommended by a qualified botanist, including transplanting or reseeding in suitable habitat, shall be implemented according to the revegetation plan (M-BI-1c).

Mitigation Measure M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat.

Construction contractor(s) shall limit the construction disturbance area to that necessary for project construction and avoid non-project areas by posting signage delineating the construction disturbance area with flags, stakes, or fencing.

Mitigation Measure M-BI-1c – Revegetation Plan.

A qualified ecologist shall prepare and implement a revegetation plan with detailed specifications for restoring all temporarily disturbed areas. The plan shall include or provide for the following:

- Preconstruction surveys of representative areas to characterize vegetation composition, including species present, vegetation characterization (tree diameter, etc.), percent cover contributed by each plant species, and total cover by natives, non-natives, and target invasive plant species. Photo points shall also be used to document pre-project conditions. The surveys shall be performed by a qualified ecologist with experience in vegetation restoration.

- Use of locally native, ecologically appropriate species for revegetation. Only native species known to occur on the Peninsula Watershed in the affected habitat types shall be used in the planting and seeding palettes. Local native seeds should be sourced from the watershed where possible. Upon approval of the SFPUC or approved representative, some seed may be sourced from suppliers who specialize in locally sourced seed from the greater Bay Area region.

- Sanitation measures (e.g., locally sourced cuttings, the elimination of container stock, or the exclusive use of container plants that were grown according to plant pathogen best management practices) to prevent the introduction and/or spread of sudden oak death, other plant pathogens, and invasive plants during revegetation.

- Performance criteria and measures to control/remove target invasive plants. Control species shall include those ranked by Cal-IPC as high or moderately invasive, except those that are already widespread in the watershed (e.g., non-native bromes, rough cat's ear [*Hypochaeris radicata*], Italian ryegrass [*Festuca perennis*], wild oats [*Avena fatua*], etc.). The revegetation plan shall distinguish between well-established invasives not targeted for management and invasives targeted for management. Target invasive plants include but are not be limited to the following: yellow star-thistle, purple star-thistle, Italian thistle, shortpod mustard, poison hemlock, and large periwinkle. Because the proposed trail may serve as a conduit for spread of weeds, controlling newly introduced invasive weeds promptly and effectively at disturbed construction sites is critical. The performance standard for target invasive weeds shall be no more than 10 percent absolute cover during the five-year performance period.

- The minimum performance criteria shall include:

  – Combined native and naturalized[105] plant cover (50 percent cover; or equal to or greater than baseline within five years) (applies to non-maintained areas only)

  – Maximum cover by target invasive plant species (no more than 10 percent absolute cover during each year of the monitoring period)

If special-status plants are identified within the active work area and cannot be avoided, the revegetation plan shall include salvage and transplantation measures to seed or relocate affected plants to an appropriate nearby revegetation site. The qualified ecologist

[105] Note that naturalized species may include Cal-IPC moderate species such as non-native bromes, Italian ryegrass, wild oats, and other species found in the Peninsula Watershed.

shall identify those plants for which translocation would likely be successful and feasible, and for each of those species the plan shall include a description of microhabitat conditions necessary for the species, salvage and transplantation procedures, seed collection and germination methods, an assessment of potential transplant and enhancement sites, performance criteria (e.g., less than 10 percent coverage by target invasive plants and comparable plant abundance, as deemed appropriate for the affected species), and a long-term monitoring program. Special-status plant mitigation areas shall be established at a ratio of 1:1 (impacted area to plantings) based on either the impacted area or the number of impacted individuals, as deemed appropriate by the qualified ecologist. Plants that can be feasibly relocated shall be transplanted into the revegetation site, typically adjacent suitable habitat that is unoccupied, to avoid making transplants into undisturbed occupied habitat and potentially spreading diseases. If salvage and transplantation is not feasible, consistent with the requirements of the Native Plant Protection Act, the SFPUC shall notify the California Department of Fish and Wildlife at least 10 days prior to disturbance to allow for the salvage of rare or endangered native plants that would otherwise be destroyed.

Mitigation Measure M-BI-1d – Worker Environmental Training.

A qualified biologist shall conduct a biological resources awareness training session for all construction personnel. A qualified biologist is an individual with a four-year degree in biological sciences and familiarity with the special-status species and their habitat that may occur on the site. The training shall be provided for all personnel prior to individuals conducting any work on site, including vegetation clearing. At a minimum, the training shall include:

- A description of rare plants and sensitive vegetation communities that may be encountered, and means of avoiding or minimizing impacts on these species and communities
- A description of the San Francisco garter snake, California red-legged frog, marbled murrelet, and other special-status species that may be encountered, the importance of these species and their habitat, the measures being implemented to conserve these species, the boundaries within which the project construction shall occur, and the penalties for failing to comply with biological mitigation requirements
- A description of listed butterflies and how to avoid impacts on these species and their host plants
- Instruction that personnel shall not feed or otherwise attract any wildlife or bring pets into the project area, adherence to speed limits and proper trash removal, and other best management practices
- Orientation regarding the importance of preventing the spread of invasive weeds and plant pathogens, and means of avoiding such spread

Access Program Variants 2 and 3

In addition to the project components identified above for the proposed access program and access program variant 1 (e.g., parking areas, restrooms, loop trail, Cemetery and Portola gates boundary fencing improvements, etc.), under access program variants 2 and 3, the SFPUC would

install fencing along the Fifield-Cahill ridge trail, from Portola Gate to Cemetery Gate, inclusive of the loop trail. The fencing proposed along the Fifield-Cahill ridge trail would generally be located within 50 feet of the trail centerline, but might be closer or farther in some locations based on site-specific considerations. Workers would install fencing using hand tools, power tools, or truck-mounted equipment. Fencing installation would require vegetation in the work area to be crushed, masticated, or cut by hand and mulched in place. The SFPUC would allow vegetation to regrow after fence installation and would not maintain it in a cleared condition.

The temporary vegetation impact from fencing under access program variant 2 and variant 3 would be approximately 11.3 acres (see Table 4.8-6). The permanent vegetation impact from fencing proposed under access program variants 2 and 3 would be approximately 0.6 acres.[106] As explained previously, the other developments proposed under access program variants 2 and 3 would be the same as for the proposed access program and access program variant 1. In addition, access program variants 2 and 3 would include fencing along each side of the trail north of Cemetery Gate.

Franciscan onion, western leatherwood and other rare plants have been identified along the Fifield-Cahill ridge trail.[107] However, the SFPUC has not conducted special-status plant surveys during suitable blooming periods for the proposed Fifield-Cahill ridge trail fencing alignments, which pass through vegetation on the sides of the trail. The SFPUC would install the proposed fence within several habitat types. Construction in Douglas fir and oak woodland habitat could directly affect populations of white-flowered rein orchid, San Mateo woolly sunflower, bent-flowered fiddleneck, Franciscan onion, and San Francisco collinsia, if present. Construction in grassland, coyote brush scrub, and coffeeberry scrub could affect Franciscan onion, bent-flowered fiddleneck, San Francisco collinsia, western leatherwood, Point Reyes horkelia, arcuate bush mallow, woodland woollythreads, and coastal triquetrella, if present. Low-lying moist or clay soils in construction areas could support Choris' popcornflower, Franciscan onion, or bent-flowered fiddleneck. Non-native-dominated Monterey cypress or Monterey pine stands also have marginal habitat to support western leatherwood.[108] As discussed above, these plants have limited distribution on the San Francisco Peninsula, and their statewide rarity signifies the potential vulnerability of these plant populations to impacts.

Access program variants 2 and 3 would temporarily or permanently disturb an estimated 13 acres of natural communities with the potential to contain rare plants. For the reasons noted previously, these areas could support a number of special-status plant species but have not been surveyed for those plants. Thus, this analysis conservatively assumes that rare plants may occur

[106] The 0.6-acre area of permanent vegetation impact on Fifield-Cahill ridge trail from fencing under access program variants 2 and 3 was calculated by subtracting the acreage of permanent impact under the proposed access program and variant 1 (0.76 acres) from the area of permanent impact under access program variants 2 and 3 (1.38 acres). The difference between these two numbers is primarily attributable to the additional fencing that would be installed along Fifield-Cahill ridge trail under unsupervised access (variants 2 and 3) (see Table 4.8-6).

[107] SFPUC, Natural Resources Division, *Geographic Information System Database for Peninsula Watershed - Rare Plants*, 2017.

[108] Calflora [web application], Berkeley, California: The Calflora Database, 2018, *http://www.calflora.org/*, accessed June 13, 2018.

within the unsurveyed portion of the project area, although most of this area is not likely to contain undiscovered rare plants.

In the absence of site-specific surveys and identification of special-status plants, the potential for substantial loss of special-status plants cannot be entirely ruled out or quantified at this time. Therefore, this EIR concludes that construction of the universal access loop trail and four-car parking area and Fifield-Cahill ridge trail fencing under access program variant 2 and variant 3 could have a significant impact on special-status plant species.

Implementation of Mitigation Measures M-BI-1a, Avoidance Measures for Special-Status Plant Species; M-BI-1b, Minimization Measures for Special-Status Plant Species and their Habitat; M-BI-1c, Revegetation Plan; and M-BI-1d, Worker Environmental Training, would reduce these impacts to a less-than-significant level by requiring surveys of project areas where the potential presence of special-status species cannot be entirely ruled out; avoidance of special-status plant individuals and populations, if present; minimization measures to reduce the project footprint; and revegetation of temporarily affected habitat. As noted for the proposed access program and variant 1, the potential for impacts related to invasive plants and plant pathogens is discussed under Impact BI-7, and the potential for impacts on protected trees under Impact BI-8, below.

> *Mitigation Measures M-BI-1a through M-BI-d apply to construction of the universal access loop trail and four-car parking area, Cemetery Gate and Portola Gate boundary fencing improvements, and fencing along the Fifield-Cahill ridge trail under access variants 2 and 3.*
>
> **Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.**
>
> (See page 4.8-50 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat.**
>
> (See page 4.8-50 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1c – Revegetation Plan.**
>
> (See page 4.8-51 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1d – Worker Environmental Training.**
>
> (See page 4.8-52 a description of the mitigation measure.)

Southern Skyline Ridge Trail

Proposed Access Program and Variants

As discussed in Chapter 2, Project Description (Table 2-1), and estimated by habitat type in Table 4.8-6, approximately 5.7 acres of vegetation potentially containing rare plants would be permanently affected and approximately 27.5 acres would be temporarily affected as a result of the southern skyline ridge trail construction, including that associated with work areas, parking lots, gates, staging areas, a kiosk, drainages, access drives, retaining walls, fencing, and restrooms. As discussed above, qualified botanists conducted rare plant surveys in 2015 and 2016

for all proposed work areas, except the additional areas required for fencing installation.[109,110] The botanists noted the presence of Douglas fir and coast redwood forest habitat types, coyote brush scrub, managed fuelbreak, and developed habitat or non-native-dominated vegetation, but did not identify special-status plant species. Therefore, construction in the previously surveyed areas would have a less-than-significant impact on special-status plants.

As noted, while the surveys conducted for the southern skyline ridge trail corridor and construction areas found no rare plants in these areas, surveys for special-status plants have not been conducted for the proposed southern skyline ridge trail fencing alignments. Of the 27.5 acres of temporary impact along the southern skyline ridge trail alignment, fencing construction would temporarily affect an estimated 2.5 acres (with an up to 6-foot-wide work area along each fence line). The total area of permanent vegetation impacts for all southern skyline ridge trail components would be 5.7 acres (see Table 4.8-6; fence posts would permanently affect approximately 0.18 acre [not shown on table]).[111] The absence of rare plants within the trail alignment suggests a similarly low potential for rare plants to occur within the adjacent fence alignment. However, since this area has not been surveyed, the potential for rare plants to occur within the fence alignment cannot be ruled out. Thus, this EIR assumes an approximately 2.5-acre area of potential habitat for special-status plants could be temporarily disturbed during installation of the southern skyline trail fencing.

The clearing and/or crushing of vegetation for fencing construction in coast redwood, Douglas fir, and tanoak forest and oak woodland habitat could directly affect populations of Montara manzanita, Kings Mountain manzanita, bent-flowered fiddleneck, Franciscan onion, and San Francisco collinsia. Construction in grassland, coyote brush scrub, and coffeeberry scrub could affect Franciscan onion, bent-flowered fiddleneck, San Francisco collinsia, western leatherwood, Point Reyes horkelia, arcuate bush mallow, woodland woollythreads, and coastal triquetrella. Low-lying moist or clay soils in construction areas could support Choris' popcornflower, Franciscan onion, or bent-flowered fiddleneck. Non-native-dominated Monterey cypress or Monterey pine stands may also support western leatherwood. As discussed above, none of these plants were observed within the trail alignment and construction area, suggesting a similarly low potential for them to occur in the adjacent fence alignment area.

In the absence of site-specific surveys showing otherwise, the potential for loss of special-status plants cannot be ruled out or quantified. Due to the limited area of proposed ground disturbance and the extent of vegetation clearing within the fencing area, the adverse effect on the overall population of any special-status plant species within the watershed would likely be small. However, because the potential for loss of special-status plants cannot be entirely discounted, this EIR conservatively concludes that construction of the proposed fencing along the southern

[109] Simono, Scott, *The Proposed Southern Skyline Boulevard Bay Area Ridge Trail Extension and Skylawn Staging Area: Surveys for Special-Status Plants along the Proposed Trail Route on San Francisco Public Utilities Peninsula Watershed Lands*, memo to file dated July 21, 2015, 11 pp.
[110] AECOM, *Draft Natural Environment Study*, July 2017.
[111] See Chapter 2, Project Description, Table 2-1, of this EIR.

skyline ridge trail could have a significant impact on special-status plant species under the proposed access program and variants.

Implementation during project construction of Mitigation Measures M-BI-1a, Avoidance Measures for Special-Status Plant Species; M-BI-1b, Minimization Measures for Special-Status Plant Species and their Habitat; M-BI-1c, Revegetation Plan; and M-BI-1d, Worker Environmental Training, would reduce these impacts to a less-than-significant level by requiring surveys of project areas where the potential for presence of special-status species cannot be ruled out; avoidance of special-status plant individuals and populations, if present; minimization measures to reduce the project footprint; measures to reduce the spread of invasive plants; and revegetation of temporarily affected habitat.

> *Mitigation Measures M-BI-1a through M-BI-d apply to construction of the southern skyline ridge trail fencing under the proposed access program and variants.*
>
> **Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.**
>
> (See page 4.8-50 for a description of mitigation measure)
>
> **Mitigation Measure M-BI-1b – Minimization Measures for Special-Status Plant Species and their Habitat.**
>
> (See page 4.8-50 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1c – Revegetation Plan.**
>
> (See page 4.8-51 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1d – Worker Environmental Training.**
>
> (See page 4.8-52 for a description of the mitigation measure.)

Impact Conclusion for the Proposed Access Program

As noted above, the SFPUC botanists conducted protocol rare plant surveys for portions of the project area north of S.R. 92 (i.e., 50-car parking area) and south of S.R. 92 (all work areas except fencing alignment) and found these areas do not contain rare plants. However, such surveys have not been conducted for the universal access loop trail and four-car parking area and, Cemetery and Portola gates boundary fencing improvement areas, or the southern skyline ridge trail fencing alignment. As a result, the presence of species in these areas cannot be ruled out. Therefore, this EIR conservatively concludes that construction activities under the proposed access program could have a significant impact on special-status plant species. Implementation of Mitigation Measures M-BI-1a through M-BI-1d would reduce impacts on special-status plant species to a less-than-significant level. For the reasons presented, construction of the project with the proposed access program would have a less-than-significant impact on special-status plants with implementation of the recommended mitigation.

Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife. (Less than Significant with Mitigation)

The management plan EIR considers the potential effects of project construction on special-status wildlife. The document concludes potential effects of construction could be significant and recommends Program-Level Mitigation Measure E.2 to reduce those impacts.[112] The measure calls for avoiding disturbance to species, especially nesting birds. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on special-status wildlife and of the efficacy of the previously identified mitigation. Accordingly, in consideration of this new information as well as changes in the status and distribution of special-status wildlife, this EIR presents updated and refined mitigation measures for special-status wildlife based on the following:

- Existing habitat conditions
- Known or presumed occurrence of sensitive habitats and protected species
- Construction activities and the expected area of ground disturbance
- Long-term access, operations, and maintenance (see Impact BI-5)

This evaluation of project impacts on special-status wildlife species is based either on known population locations or the potential presence of suitable special-status wildlife species habitat. This analysis assesses impacts on special-status species in terms of potential changes in the amount and distribution of suitable habitat, the relative importance of the affected habitats, and the potential for direct loss of individuals.

Section 4.8.2.8, *Special-Status Species*, discusses the special-status wildlife species that may occur in the project area. This evaluation focuses on species that are present or have a moderate or high potential to occur in the project area and that could be affected by project activities: San Francisco garter snake, California red-legged frog, marbled murrelet, Mission blue butterfly, San Bruno elfin butterfly, San Francisco dusky-footed woodrat, American badger, and special-status nesting birds and roosting bats. Mitigation measures identified to protect these species would also afford protection for additional special-status species in the project area, such as California giant salamander (see Table 4.8-3).

Impacts on habitat are defined as temporary or permanent disturbance and are based on the SFPUC's ability to restore species habitat following construction. The SFPUC would restore areas of temporary impact following construction, but permanent impacts would alter the habitat to a developed landscape such that it would not provide species habitat in the future.

[112] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-6 (p. III.E-32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI Natural Resources (pp. VI-3 and VI-4).

San Francisco Garter Snake, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

San Francisco garter snake is a federally and state-listed endangered species and is fully protected in California. The management plan EIR notes the presence of a "well established, viable" San Francisco garter snake population in the Mud Dam pond area. San Francisco garter snake is present on Sweeney Ridge, the Five Points/Mud Dam, the Pilarcitos Creek and Pilarcitos Reservoir wetlands, the San Andreas sag pond, and along Upper and Lower Crystal Springs reservoirs.[113] Trapping studies in the watershed in 2005, 2008, and 2011 found the species in multiple locations, and, in 2015, eight San Francisco garter snakes were trapped on both sides of the Fifield and Cahill ridges (between 300 and 800 feet of the ridge trail) during daylight hours.[114] San Francisco garter snakes appear to remain near wetland areas due to the availability of amphibian prey, but snakes of this species also transit through grassland and roadside habitats. Most individuals remain within 300 to 650 feet of pond foraging habitats and wintering upland sites, though greater travel distances have been reported. The ridge trail is within 200 to 300 feet of suitable aquatic habitat surrounding Pilarcitos Reservoir, 700 to 800 feet of suitable aquatic habitat at Mud Dam, and within 0.5 mile of suitable aquatic habitat at Lower Crystal Springs Reservoir. The U.S. Fish and Wildlife Service's five-year review suggests that San Francisco garter snakes have a relatively small home range, with recaptures often occurring near the same burrows and movement generally limited to within 0.7 mile of aquatic sites.[115] Based on the trapping study in 2015 and the above-described movement distances, the species might use the immediate Fifield-Cahill ridge trail area to move between Pilarcitos Reservoir and Mud Dam pond or between Lower Crystal Springs Reservoir and Pilarcitos Creek.[116]

The Peninsula Watershed supports one of six remaining major populations of San Francisco garter snake. The U.S. Fish and Wildlife Service attributes the persistence of quality species habitat and high snake densities in the watershed to infrequent human use. The fish and wildlife service's five-year review cites habitat loss and degradation as primary threats to species recovery. The five-year review identifies degradation of San Francisco garter snake habitat in the

[113] Swaim Biological, Inc., *Results of Surveys for the San Francisco Garter Snake and California Red-legged Frog at Mud Dam, Laguna Creek, and Skyline Quarry, San Mateo County, California*, 2005; *Results of the 2005 Surveys for the San Francisco Garter Snake and California Red-legged Frog at Mud Dam 1, Mud Dam 2, Skyline Quarry, and Stone Dam, San Mateo County, California*, 2006; *2007 Progress Report CS-837D: Results of Surveys for the San Francisco Garter Snake and California Red-legged Frog at San Mateo Dam and Pilarcitos Creek from Stone Dam Reservoir to Pilarcitos Reservoir, San Mateo County, California*, 2008a; *Results of Surveys for the San Francisco Garter Snake and California Red-legged Frog on SFPUC Lands, San Mateo County, California,* 2008b; *Results of Surveys for the San Francisco Garter Snake and California Red-legged Frog, San Mateo County, California Final Report: CS-837D*, 2008c; *Peninsula RMC San Francisco garter snake trapping survey results,* 2012.

[114] Yacelga, M., Stagnaro, B. and T. Lim, 2016 San Francisco Garter Snake Trapping Results (Cahill Ridge Road, Mud Dam 1, and Pilarcitos Reservoir), Letter report from BioMaAs, Inc. and AECOM to the San Francisco Public Utilities Commission, October 31, 2016.

[115] U.S. Fish and Wildlife Service, *San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation*, U.S. Fish and Wildlife Service Sacramento Field Office, Sacramento, CA, September 2006.

[116] Yacelga, M., Stagnaro, B. and T. Lim, 2016 San Francisco Garter Snake Trapping Results (Cahill Ridge Road, Mud Dam 1, and Pilarcitos Reservoir), Letter report from BioMaAs, Inc. and AECOM to the San Francisco Public Utilities Commission, October 31, 2016.

Peninsula Watershed due to current and potential future expansion of public trails as a primary threat to this subpopulation.[117]

If San Francisco garter snakes are present during construction of project components proposed along Fifield-Cahill ridge trail within 0.7 miles of the species' aquatic habitat—including the loop trail and improvements to existing boundary fencing at Cemetery and Portola gates—short-term direct impacts on this species could include fatalities or disturbance to essential behaviors such as feeding, dispersing, and breeding. Vehicles, equipment, or workers could crush individuals or their burrows or cause harassment from noise or vibration. Vegetation removal for trail construction, parking, or fencing improvements could also disturb and/or harm sheltering snakes. Construction of the loop trail and improvements to boundary fencing could result in mortality, injury, or disturbance to snakes from trampling or vehicle traffic.

For the reasons above, construction of the loop trail and improvements to existing fencing at Cemetery and Portola gates under the proposed access program and variant 1 along the Fifield-Cahill ridge trail could result in a substantial adverse effect on San Francisco garter snake, which is a significant impact. Implementation of Mitigation Measures M-BI-1c, Revegetation Plan; M-BI-1d, Worker Environmental Training; and M-BI-2a, Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians, would reduce this impact to a less-than-significant level by requiring restoration of temporarily affected habitat, worker environmental training, wildlife exclusion from construction zones, and biological monitoring during construction.

Mitigation Measures M-BI-1c, M-BI-1d, and M-BI-2a apply to construction of the Fifield-Cahill ridge trail improvements under the proposed access program and variant 1.

Mitigation Measure M-BI-1c – Revegetation Plan.

(See page 4.8-51 for a description of the mitigation measure.)

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.

The following measures shall be implemented before and during construction:

- Construction contractor(s) shall limit the construction disturbance area to that necessary for project construction and avoid outside areas by posting signage delineating the construction disturbance area with flags, stakes, or fencing.

- The SFPUC shall identify a qualified biologist (who has familiarity and field experience with the affected species, as described in M-BI-1d) to act as construction monitor before construction work begins.

[117] U.S. Fish and Wildlife Service, *San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation*, U.S. Fish and Wildlife Service Sacramento Field Office, Sacramento, CA, September 2006.

- No more than two weeks prior to the onset of work activities and immediately prior to commencing work, the qualified biologist shall conduct a thorough survey of the entire construction footprint for San Francisco garter snake, California red-legged frog, and other special-status species with the potential to be present.
- The SFPUC shall ensure that, during work activities, all trash is properly contained in closed containers, removed from the work site and disposed of daily to avoid attracting predators to the site.
- The contractor and all site personnel in motorized vehicles shall maintain a speed limit of 15 miles per hour within the project area at all times.
- The construction contractor shall install a wildlife exclusion fence in or adjacent to wetland areas where earthmoving equipment will be used. The qualified biologist shall determine specific locations for the exclusion fencing and shall be present during, and oversee vegetation removal for, construction of the exclusion fence.
- The contractor shall install an exclusion fence containing exit funnels to allow any San Francisco garter snakes within the construction area to leave without human intervention while preventing entry of San Francisco garter snake and California red-legged frog into the construction zone. Exit funnels shall be placed no more than 200 feet apart along the fence, or as modified by the biological monitor. The exit funnels shall be installed at ground level.
- At the beginning of each workday that includes initial ground disturbance, including grading, excavation, and vegetation-removal activities, the approved biologist shall conduct onsite monitoring for the presence of these species in the area where ground disturbance or vegetation removal will occur. The biologist shall inspect the perimeter fences to ensure they do not have any tears or holes, that the bottoms of the fences are still buried, and that no individuals have been trapped in the fences.
- Construction work crews shall cover all excavated or deep-walled holes or trenches greater than 2 feet at the end of each workday using plywood, steel plates, or similar materials or shall construct escape ramps of earth fill or wooden planks to allow animals to exit. Before such holes are filled, workers shall thoroughly inspect them for trapped animals.
- If a special-status species is present within the exclusion fence area during construction, work shall cease in the vicinity of the animal, and the animal shall be allowed to relocate of its own volition unless otherwise approved by the regulatory agencies with jurisdiction over the species.
- The contractor shall maintain the temporary fencing—both exclusion fencing and protective fencing (if installed)—until all construction activities are completed. No construction activities, parking, or staging shall occur beyond the fenced exclusion areas. After construction is completed, the contractor shall remove exclusion fencing, cover boards, and all associated debris and either store or dispose of it off site.
- Project personnel shall be required to immediately report any harm, injury, or mortality of a special-status species during construction (including entrapment) to the biological monitor, who shall immediately notify the SFPUC. As appropriate, the SFPUC shall provide verbal notification to the U.S. Fish and Wildlife Service's Endangered Species Office in Sacramento, California and/or to the California

Department of Fish and Wildlife warden or biologist (as applicable) and written notification, as requested, by the agencies.

- Once all initial ground-disturbing activities are completed, the biological monitor shall perform spot checks of the project area at least once a week, and daily between November and April during rain events, for the duration of construction to ensure that the perimeter fence is in good order, trenches are being covered if left open overnight (or escape ramps provided), project personnel are conducting checks beneath parked vehicles prior to their movement, and all other required biological protection measures are being followed.

Access Program Variants 2 and 3

Access program variant 2 and variant 3 would include all the project components and associated construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along the Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. During fence installation, vegetation removal would be avoided where feasible; otherwise, a 6-foot-wide swath of vegetation would be trimmed to within 12 inches of the ground (3 feet on each side of the fence alignment) by hand where feasible. Where hand clearing is not feasible, the SFPUC would use a compact utility vehicle, such as a skid steer or similar small vehicle. Activities to reduce vegetation using mechanized equipment and to install the fence could harass, injure, or kill active or sheltering San Francisco garter snakes, if present, from noise and vibration or trampling, which would be a substantial adverse effect. As described for Impact BI-1, under baseline conditions, SFPUC maintenance vehicles use trails on a limited basis (i.e., about 1 to 5 trips per day). Because this limited traffic is restricted to the existing road, the vehicle traffic and associated noise and vibration likely have a negligible effect on snakes. Under variants 2 and 3, vibration and noise disturbances would also occur in more natural, off-trail habitat that is more likely to support snakes, with an associated greater level of disturbance during vegetation removal and vehicle/equipment traffic for fence installation. Relative to habitat effects, fence installation would permanently disturb a small amount of habitat but would not adversely affect connectivity due to the use of wildlife-friendly fencing.

For the reasons identified above for the proposed access program and access program variant 1, implementation of variants 2 and 3 along the Fifield-Cahill ridge trail could result in a significant adverse effect on San Francisco garter snake. Implementation of Mitigation Measures M-BI-1c, Revegetation Plan; M-BI-1d, Worker Environmental Training; and M-BI-2a, Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians, would reduce this impact to a less-than-significant level by requiring restoration of temporarily affected habitat, worker environmental training, wildlife exclusion from construction zones, and biological monitoring during construction.

Mitigation Measures M-BI-1c, M-BI-1d, and M-BI-2a apply to construction of the Fifield-Cahill ridge trail improvements under variants 2 and 3.

Mitigation Measure M-BI-1c – Revegetation Plan.

(See page 4.8-51 for a description of the mitigation measure.)

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.

(See page 4.8-59 for a description of the mitigation measure.)

San Francisco Garter Snake, Southern Skyline Ridge Trail

Proposed Access Program and Variants

The potential for occurrence of San Francisco garter snake is considered low in the southern skyline ridge trail portion of the project area, which is 1 mile from known populations of San Francisco garter snake and from suitable aquatic breeding habitat at Upper Crystal Springs Reservoir. As noted above, San Francisco garter snakes have a relatively small home range, with movement generally limited to within about 0.7 mile of aquatic sites, and much of the southern skyline ridge trail is greater than 1 mile from suitable aquatic foraging habitat.[118,119] In addition, because the trail alignment is adjacent to S.R. 35 on a ridgeline with no adjacent aquatic habitat, San Francisco garter snakes are unlikely to use the area as dispersal habitat. There have been no recorded sightings of this species within 0.7 mile of the site since 1957, when one was recorded near the intersection of S.R. 92 and S.R. 35. For these reasons, construction of the southern skyline ridge trail would not have a significant impact on San Francisco garter snake under the proposed access program and variants, and no mitigation is required.

California Red-Legged Frog, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

California red-legged frog is known to occur in the project area. It has been detected on both sides of the Fifield-Cahill ridge trail; at Mud Dam and on San Mateo Creek; in Pilarcitos Creek and Reservoir; and in Upper and Lower Crystal Springs reservoirs.[120] California red-legged frog is a federally listed threatened species and a California species of special concern. The watershed supports the only designated critical habitat unit for this species on the San Francisco Peninsula. This habitat is important for maintaining the distribution of the California red-legged frog population within the San Francisco area and provides connectivity to population units farther south into Santa Cruz County.[121]

While California red-legged frogs may be locally numerous within appropriate habitat, they are rare statewide. Portions of the Peninsula Watershed provide a unique example of undeveloped high-quality habitat for this species. In addition, California red-legged frogs are a primary prey

[118] U.S. Fish and Wildlife Service, *San Francisco Garter Snake (Thamnophis sirtalis tetrataenia) 5-Year Review: Summary and Evaluation,* U.S. Fish and Wildlife Service Sacramento Field Office, Sacramento, CA, September 2006.
[119] Yacelga, M., Stagnaro, B. and T. Lim, 2016 San Francisco Garter Snake Trapping Results (Cahill Ridge Road, Mud Dam 1, and Pilarcitos Reservoir), Letter report from BioMaAs, Inc. and AECOM to the San Francisco Public Utilities Commission, October 31, 2016.
[120] California Department of Fish and Wildlife, California Natural Diversity Database, accessed January 12, 2017.
[121] U.S. Fish and Wildlife Service, *Recovery Plan for the San Francisco Garter Snake, Thamnophis sirtalis tetrataenia*, Final Report, U.S. Fish and Wildlife Service, Portland, Oregon, 1985.

item for San Francisco garter snake, and suitable garter snake habitat is associated with populations of breeding red-legged frogs. Due to their propensity to disperse from breeding sites in large numbers at certain times of the year (e.g., following rainfall events), California red-legged frogs could be vulnerable to direct injury or mortality as a result of construction activities.

The proposed loop trail, 50-car parking lot and restroom area, boundary fencing improvements, and the universal access four-car parking area would be constructed within potential upland habitat for California red-legged frog. California red-legged frogs may use trail cut areas as an upland movement corridor. Construction of the 0.5-mile loop trail would result in temporary impacts along a 30-foot-wide construction corridor, and permanent surface disturbance of approximately 0.6 acre. An existing wetland within 9 feet of the trail corridor provides seasonal low-quality cover for California red-legged frog but does not pond adequately to support red-legged frog breeding or year-round habitat. Trail construction activities near the wetland could have direct and indirect effects on the species, if present.

Construction vehicles, equipment, or workers could crush individuals or their burrows or cause harassment from noise or vibration. Vegetation removal could disturb and/or harm sheltering frogs. These impacts could result in fatalities or disturb essential behaviors such as feeding, dispersing, and breeding, which would be significant. Implementation of Mitigation Measures M-BI-1c, Revegetation Plan; M-BI-1d, Worker Environmental Training; and M-BI-2a, Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians, would reduce this impact to a less-than-significant level by requiring restoration of temporarily affected habitat, worker environmental training, wildlife exclusion fencing, and biological monitoring during construction.

> *Mitigation Measures M-BI-1c, M-BI-1d, and M-BI-2a apply to construction of Fifield-Cahill ridge trail improvements under the proposed access program and variant 1.*
>
> **Mitigation Measure M-BI-1c – Revegetation Plan.**
>
> (See page 4.8-51 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1d – Worker Environmental Training.**
>
> (See page 4.8-52 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.**
>
> (See page 4.8-59 for a description of the mitigation measure.)

Access Program Variants 2 and 3

Access program variant 2 and variant 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. When needed, up to a 6-foot-wide swath of vegetation would be trimmed to within 12 inches of the ground so that workers could install these fences (3 feet on each side of the fence alignment). As described for the San Francisco garter snake, above, the vegetation reduction and use of a compact utility vehicle to install fencing could injure or kill California red-

legged frogs. For the reasons described for the proposed access program and access program variant 1, such impacts would be significant.

Implementation of Mitigation Measures M-BI-1c, Revegetation Plan; M-BI-1d, Worker Environmental Training; and M-BI-2a, Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians would reduce this impact to a less-than-significant level by requiring restoration of temporarily affected habitat, worker environmental training, wildlife exclusion fencing, and biological monitoring during construction.

> *Mitigation Measures M-BI-1c, M-BI-1d, and M-BI-2a apply to construction of Fifield-Cahill ridge trail improvements under variants 2 and 3.*
>
> **Mitigation Measure M-BI-1c – Revegetation Plan.**
>
> (See page 4.8-51 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-1d – Worker Environmental Training.**
>
> (See page 4.8-52 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.**
>
> (See page 4.8-59 for a description of the mitigation measure.)

California Red-Legged Frog, Southern Skyline Ridge Trail

Proposed Access Program and Variants

California red-legged frog habitat occurs approximately 0.75 mile from the northern portion of the southern skyline ridge trail alignment. Recorded sightings of red-legged frogs are frequent in the vicinity of Upper Crystal Springs Reservoir. This species disperses 0.5 mile or farther from aquatic sites and may disperse 1 to 2 miles from breeding sites.[122] The southern skyline ridge trail project area, including fencing alignments, represent potential upland dispersal habitat for California red-legged frog. This species may seasonally use drainages or trail cuts as movement corridors during nighttime or wet weather, as adult frogs are more active at night and during the wet season. Under existing conditions, S.R. 35 presents a partial barrier to wildlife moving from one side of the ridge to the other.[123,124] However, frogs may disperse into the project area from known habitat to the east. For the reasons described above for the Fifield-Cahill ridge trail, construction of the southern skyline ridge trail and fencing could injure or kill this species, if present, under the proposed access program and variants, which would be a significant impact.

[122] U.S. Fish and Wildlife Service, *Recovery Plan for the California Red-legged Frog (Rana draytonii)*, U.S. Fish and Wildlife Service, Portland, Oregon, 2002.
[123] Ibid.
[124] Caltrans, 2017 Traffic Volumes, *http://www.dot.ca.gov/trafficops/census/volumes2017/Route34-43.html*, accessed June 14, 2019.

Implementation of Mitigation Measures M-BI-1c, Revegetation Plan**,** M-BI-1d, Worker Environmental Training; and M-BI-2a, Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians would reduce this impact to a less-than-significant level by requiring worker environmental training, restoration of temporarily affected habitat, frog exclusion from construction zones, and biological monitoring.

Mitigation Measures M-BI-1c, M-BI-1d, and M-BI-2a apply to construction of all southern skyline ridge trail components under the proposed access program and variants.

Mitigation Measure M-BI-1c – Revegetation Plan.

(See page 4.8-51 for a description of the mitigation measure.)

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Mitigation Measure M-BI-2a – Avoidance and Minimization Measures for Special-Status Reptiles and Amphibians.

(See page 4.8-59 for a description of the mitigation measure.)

Marbled Murrelet, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

The management plan EIR identifies potential impacts on marbled murrelet, a federally and state-listed endangered species, within its designated critical habitat along the Fifield and Cahill ridges (see Figure 4.8-4). The term "suitable habitat", as used here, includes tracts of old-growth Douglas fir that currently support murrelet nesting, and nearby trees with potential to support nesting, some of which may be near or overlap the trail on Cahill Ridge. The management plan EIR notes that murrelets are especially susceptible to fire, human disturbance, and nest predation by *corvids* (e.g., jays, crows, and ravens).[125] The SFPUC has conducted annual monitoring in the Pilarcitos Watershed west of Cahill Ridge since 2001, as recommended in the management plan EIR as part of the Program-Level Mitigation Measure E.1, and each year monitors have observed murrelets (auditory and visual detections of flyovers). Annual monitoring is expected to continue under the project. The management plan EIR discusses the potential for noise and disturbance from construction to result in nest abandonment or altered parental behavior for nesting birds, including murrelets. It also discusses the threat from corvid predation to nesting birds, and notes that—because corvid species are known predators of murrelet nest—human activity that encourages corvid predators has the potential to cause indirect harm to nesting murrelets.[126] A high percentage of murrelet nests fail as a result of predation.[127] Literature indicates that land-use practices that attract corvids increase the risk of *depredation* (attack by predators), and that avian

[125] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources, (p. V-27).
[126] Ibid.
[127] Peery, M.Z. and R.W. Henry, Recovering marbled murrelets via corvid management: A population viability analysis approach, *Biological Conservation*, 143 (2010) pp. 2,414 to 2,424, 2010.

predation by human-subsidized species (especially corvids) is a critical contributor to the declining murrelet population.[128,129]

Within the suitable habitat area defined above, a marbled murrelet nesting colony is located within 0.5 mile of the Fifield-Cahill ridge trail in the Pilarcitos Watershed (unit MOMO-1),[130] and suitable habitat for the species (some also designated as critical habitat) overlaps the trail on Cahill Ridge in four locations. This area has a low level of disturbance, minimal habitat fragmentation, and a high potential for successful nesting and expansion in the number of nests.[131] The marbled murrelet nesting area in the Peninsula Watershed is one of two described nesting records from northern and central San Mateo County; it is the northernmost occurrence on the San Francisco Peninsula[132] and the basis for designation of critical habitat for this species in the watershed. A decline in the reproductive success of marbled murrelets as a result of nest abandonment could eliminate this species from the watershed.[133]

Current activities in the portion of Cahill Ridge within suitable habitat include regular maintenance traffic by SFPUC vehicles and docent-led visitation up to three days per week, which could cause minor auditory and visual disturbances to nesting marbled murrelets. The U.S. Fish and Wildlife Service provides the following threshold guidance to estimate the effects of such disturbances:

- Project-generated sound exceeds ambient nesting conditions by 20 to 25 decibels (dB).
- Project-generated sound, when added to existing ambient conditions, exceeds 90 dB.
- Human activities occur within a visual line-of-sight distance of 40 meters (approximately 44 yards) or less from a nest.[134]

The U.S. Fish and Wildlife Service recognizes that noise levels generated by a typical chainsaw range from 60 dB to 117 dB and large work trucks range from about 88 dB to 96 dB. Other mechanized equipment and hand tools would also fall within this noise range. These levels compare with natural ambient noise levels of approximately 50 dB.[135] In accordance with the

128 Hamer, T.E. and S.K. Nelson, Characteristics of Marbled Murrelet nest trees and nesting stands, *Ecology and Conservation of the Marbled Murrelet* (C.J. Ralph, G.L. Hunt, Jr., M.G. Raphael, and J.F. Piatt, eds.), USDA Forest Service General Technical Report PSW-152, Albany, CA, 1995, pp. 69 to 82; Peery, M.Z. and R.W. Henry, Recovering marbled murrelets via corvid management: A population viability analysis approach, *Biological Conservation*, 143 (2010) pp. 2,414 to 2,424. 2010.

129 Avocet Research Associates, *Protocol-level nesting season surveys for the Marbled Murrelet* (*Brachyramphus marmoratus*), San Francisco Public Utility Commission Lands, Upper Pilarcitos Creek, San Mateo County, California: 2018, Prepared for the SFPUC Land and Resource Management Section, Burlingame, CA and AECOM Corporation, Oakland, CA, 2018.

130 California Department of Parks and Recreation, *Marbled Murrelet Landscape Management Plan for Zone 6, Santa Cruz District*, May 2017.

131 Ibid.

132 Ibid.

133 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources, (V-27).

134 U.S. Fish and Wildlife Service (Arcata), Transmittal of Guidance: Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California, 2006, *https://www.fws.gov/arcata/es/birds/MM/documents/MAMU-NSO%20Harassment%20Guidance%20NW%20CA%202006Jul31.pdf*, accessed on April 10, 2019.

135 Ibid.

guidance, if activities in this noise range could affect murrelets within an estimated harassment distance of up to 500 feet for most activities, and 1,320 feet (0.25 mile) for relatively noisier actions.

The SFPUC's current watershed maintenance activities in this area (e.g., mowing, service road maintenance) observe these U.S. Fish and Wildlife Service noise guidelines. As explained in Section 2.6.12, Construction Schedule, of Chapter 2, Project Description, project construction activities would similarly be required to follow these guidelines, including work restrictions during the marbled murrelet nesting season.

The suitable habitat area contains tracts of old-growth Douglas fir near portions of the trail on Cahill ridge that could support murrelet nesting. In the absence of focused surveys to establish specific nest locations or demonstrate the absence of murrelets, this EIR conservatively presumes nesting murrelets could be present within suitable habitat areas. Any project-related construction disturbances that exceed stated USFWS threshold guidance within these areas during the murrelet nesting season would be a potentially significant impact on nesting murrelets, especially near sunrise or sunset when murrelets are most active.

Construction activities associated with the proposed access program and variant 1 would temporarily increase noise levels near work areas, as the work would involve the use of power tools, motorized vehicles, and require up to 10 workers for a duration of three to four months. The increased human presence would be negligible relative to baseline conditions, which include approximately 1,000 visitors per year and daily SFPUC watershed staff and maintenance crew activities. However, construction equipment and activities would increase noise levels over baseline conditions.

As stated in the U.S. Fish and Wildlife Service guidance, activities causing noise that is substantially over ambient levels (e.g., 20 to 25 dB above, or over 90 dB) in the vicinity of active marbled murrelet nests (e.g., within 0.25 mile of noisy work areas) could disturb nesting murrelets and potentially lead to nest abandonment.[136] Under the proposed access program and access program variant 1, work for the universal access loop trail and four-car parking lot, 50-car parking lot, restroom, and Cemetery and Portola gates boundary fencing improvements would occur approximately 0.5 mile from potential nesting habitat for murrelets in old-growth Douglas fir on Cahill Ridge.

Because proposed access program and variant 1 construction activities would be more than 0.5 miles from murrelet habitat, and given SFPUC's standard practice of observing U.S. Fish and Wildlife Service noise guidelines for work within 0.25 miles of suitable nesting habitat, impacts on murrelets from noise disturbance would be less than significant.

Results from nest predation studies, including those of murrelet nests, and studies of corvid abundance suggest that corvids in forested regions occur more frequently near human settlement

[136] Ibid.

and recreation, in fragmented landscapes, and along forest edges.[137] Corvid species feed on human food, trash, and roadkill and are known to increase in numbers in human-disturbed areas. Food trash generated during project construction could attract corvids to the ridge trail and increase their populations in the watershed, increasing the likelihood of predation on an active marbled murrelet nest. Increases in traffic along the trail, resulting in more roadkill, could similarly attract corvids and increase their numbers. The potential for such substantial adverse effects on the murrelet population is low because project construction would represent a minor increase in human activity in the project area relative to existing activities and development. Skylawn Memorial Park, residential development, agricultural uses, the Pilarcitos Quarry, SR-35, and SR-92 are located approximately 2 miles from critical habitat. Pilarcitos Creek Road and SFPUC watershed operations and maintenance activities as well as existing trail use and maintenance border critical habitat; thus, this impact would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Access program variant 2 and variant 3 include the same project components and would result in the same construction impacts identified above for proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. As noted previously, suitable murrelet nesting habitat (i.e., old-growth Douglas fir) is present on Cahill Ridge, and approximately 0.4 mile of proposed fencing along the trail is within suitable habitat for marbled murrelet (see Figure 4.8-3).[138] Therefore, these areas may contain nesting murrelets.

In addition to the potential disturbances described for the proposed access program and variant 1, noise generated from equipment used to trim vegetation or construct fences (such as trucks and chainsaws) could disturb murrelets within 500 and 1,320 feet (0.25 mile) of noisy work areas. As explained in Section 2.6.12, Construction Schedule, of Chapter 2, Project Description, project construction activities would observe the U.S. Fish and Wildlife Service noise guidelines, including work restrictions during the marbled murrelet nesting season, thereby avoiding significant effects on nesting murrelet.

While the proposed work crew would be small, the duration of Fifield-Cahill ridge trail work for variants 2 and 3 would extend for approximately 12 months, with several involving construction activities near or within suitable nesting habitat. During this time, food, trash, or roadkill resulting from project construction activities has the potential to increase the population of corvids, thereby increasing the potential for marbled murrelet nest predation. While the likelihood for substantial adverse effects is low, because of the rarity and susceptibility of marbled murrelets to disturbance, this EIR conservatively concludes that the impact would be significant. Implementation of Mitigation Measure M-BI-1d, Worker Environmental Training,

[137] California Department of Parks and Recreation, *Marbled Murrelet Landscape Management Plan for Zone 6, Santa Cruz District*, May 2017.
[138] Ibid.

would reduce this impact to a less-than-significant level during construction by requiring environmental awareness training for construction workers.

Mitigation Measures M-BI-1d applies to construction of Fifield-Cahill ridge trail improvements under access program variants 2 and 3.

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Marbled Murrelet, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Construction along the southern skyline ridge trail would not affect murrelets, as this area is greater than 2 miles from the critical habitat area described above for Fifield-Cahill ridge trail and approximately 1.4 miles from the Purisima Creek habitat area. Based on the U.S. Fish and Wildlife Service impact criteria, there would be no direct impacts on marbled murrelet populations because the southern skyline ridge trail is greater than 0.25 mile from the nesting areas. No indirect impacts on nesting murrelets are expected along the southern skyline ridge trail due to the distance to the murrelet nesting area, existing development, and land uses in the project area. Hence, construction of the southern skyline ridge trail would have no impact on marbled murrelet populations related to noise, disturbance, or a potential increase in nest predators.

Mitigation: None required.

Special-Status Butterflies, Fifield Cahill Ridge Trail

As noted in the management plan EIR, all life stages of Mission blue butterfly and San Bruno elfin butterfly are found along the Fifield Ridge portion of the Fifield-Cahill ridge trail. The Mission blue butterfly larval food plants (Lupinus albifrons, L. formosus, and L. variicolor) and San Bruno elfin butterfly food plant (*Sedum spathulifolium*) are also found along Fifield Ridge.[139] The management plan EIR notes that the loss of larval food plants could cause a decline or elimination of listed butterflies from the watershed.[140] The management plan EIR includes monitoring for listed butterflies and food plants in Program-Level Mitigation Measure E.3. The stated monitoring program purpose is to determine when to temporarily fence/flag stands of food plants or exclude users, including watershed maintenance crews, from portions of the trail.[141]

Since publication of the management plan EIR, annual protocol-level surveys of San Bruno elfin butterfly and Mission blue butterfly populations were conducted in the watershed and allowed for annual monitoring of population levels and host plants (see Section 4.8.2.8, *Special-Status*

[139] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (p. V-24).
[140] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (p. V-28).
[141] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.E, Natural Resources (p. VI-3).

Species).[142] Observed numbers of butterflies declined in 2016, which was thought to be related to drought conditions rather than human disturbance, because no obvious signs of trampling or damage were evident. As the 2016 monitoring report indicates, impacts on host plants from docent-led public trail usage were not observed during the 14-year monitoring period.[143] The 2016 monitoring report found no damage to lupines or nectar plants due to trampling by trail visitors was detected on the Ridge Trail during the 2016 monitoring. Similarly, no damage due to mowing of the road shoulders or fuelbreak maintenance was observed.[144]

Proposed Access Program and Access Program Variant 1

Under the proposed access program and variant 1, the SFPUC would construct two parking areas, a restroom, and a loop trail and make improvements to the existing boundary fencing at Cemetery and Portola gates. The amenities proposed for the southern portion of the trail (i.e., all but the Portola Gate boundary fencing improvements) would occur in Douglas fir and non-native grassland habitat and would not affect listed butterfly habitat. The Portola Gate boundary fencing construction would require vegetation trimming, either by hand or mechanically, to within 12 inches of the ground within an up to 6-foot-wide corridor along the fence alignment, which could result in direct or indirect removal or damage to listed butterfly host plants (*Sedum spathulifolium, Lupinus albifrons*, *L. formosus,* and *L. variicolor*) that have been identified near the trail segment from Portola Gate to approximately 1.5 miles farther south.[145] Because these butterflies are locally rare, limited in extent, and highly dependent on a food plant with limited abundance in the project area, any foot or other traffic around the host plants could have a substantial adverse effect on the species; the effects would therefore be significant. Under baseline conditions, the SFPUC surveys and flags host plants occurring along trails used by maintenance vehicles and supervised visitors. The flagging allows trail users to detect and avoid impacting the plants. However, under the proposed access program and variant 1, the SFPUC would construct boundary fencing improvements in off-trail habitat which would require increased vehicle (e.g., truck and mower) and foot traffic, within areas that have not been surveyed, and which could contain host plants. Any trampling or damage to host plants during construction may cause the take of listed butterflies, whose larvae may be present in leaf litter. Implementation during project construction of Mitigation Measures M-BI-2b, Avoidance and Mitigation for Host Plants of Listed Butterfly Species, and M-BI-1d, Worker Environmental Training, would reduce this impact to a less-than-significant level by requiring preconstruction larval host plant surveys, worker environmental training, and flagging of host plants so that workers avoid them. During construction, all impacts would be avoided with adherence to the mitigation measures below.

142 Arnold, Richard A., *Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, December 2016.
143 Ibid.
144 Ibid.
145 Ibid.

Mitigation Measures M-BI-1d and M-BI-2b apply to construction of Portola Gate boundary fencing improvements.

Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.

- Prior to any trail-related construction, vegetation management, development, or any other ground-disturbing activities, a qualified biologist (i.e., with demonstrated experience working with these species) shall conduct preconstruction surveys for butterfly larval host plants (*Sedum spathulifolium, Lupinus albifrons, L. formosus,* and *L. variicolor*). The qualified biologist shall survey any areas within 1.5 miles of Portola Gate where vegetation disturbance for fencing installation would occur.
- Prior to construction, the qualified biologist shall flag all areas containing host plants so that personnel avoid vehicular and foot traffic in these areas.

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Access Program Variants 2 and 3

Access program variants 2 and 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. For the same reasons described for the proposed access program and variant 1, fencing installation within suitable habitat along the trail (i.e., Portola Gate to approximately 1.5 miles south) could result in substantial adverse effects on listed butterflies through trampling or damage to host plants. Implementation during project construction of Mitigation Measures M-BI-2b, Avoidance and Mitigation for Host Plants of Listed Butterfly Species, and M-BI-1d, Worker Environmental Training, would reduce this impact to a less-than-significant level by requiring preconstruction larval host plant surveys, worker environmental training, and flagging of host plants so that workers avoid them. During construction, all impacts would be avoided with adherence to the mitigation measures below.

Mitigation Measures M-BI-1d and M-BI-2b apply to construction of Portola Gate boundary fencing improvements and construction of fencing on the Fifield-Cahill ridge trail from Portola Gate to approximately 1.5 miles farther south.

Mitigation Measure M-BI-1d – Worker Environmental Training.

(See page 4.8-52 for a description of the mitigation measure.)

Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.

(See page 4.8-71 for a description of the mitigation measure.)

Special-Status Butterflies, Southern Skyline Ridge Trail

Proposed Access Program and Variants

The southern skyline ridge trail lacks habitat for special-status butterflies. Therefore, there would be no impact on special-status butterflies from construction of project components south of S.R. 92.

Mitigation: None required.

Dusky-Footed Woodrat and American Badger, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

San Francisco dusky-footed woodrat is relatively abundant in densely wooded portions of the project area. Woodrats are common in forest communities and work crews could encounter woodrat nests during vegetation clearing to accommodate fence installation. American badger is moderately likely to occur in grasslands and forest habitat in the Peninsula Watershed; however, the chance that badger dens would be encountered on the trail is remote because badgers prefer less disturbed areas for denning, and they could likely be avoided if found during vegetation clearing, given that dens are small in size and unlikely to be immediately adjacent to the trail. If present, woodrat nests and badger dens could be directly affected during construction under the proposed access program and access program variant 1. If construction equipment or vehicles were to crush an occupied woodrat nest or badger den, injury or mortality could result. The loss of woodrats or their nests or badgers or their dens would be a significant impact. Implementation of Mitigation Measure M-BI-2c, Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger, would reduce this impact to a less-than-significant level by requiring preconstruction surveys for woodrat nests and badger dens, and avoidance or relocation of nests and avoidance of dens.

Mitigation Measure M-BI-2c applies to construction of Fifield-Cahill ridge trail improvements under the proposed access program and access program variant 1.

Mitigation Measure M-BI-2c – Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger.

The following measures shall be implemented to avoid and minimize impacts on dusky-footed woodrat and American badger, if present:

- A qualified biologist with experience identifying woodrat nests and badger dens shall conduct a preconstruction survey for San Francisco dusky-footed woodrat nests and American badger dens in suitable habitat along: the universal access loop trail, staging area, parking lots; the southern skyline ridge trail work area, parking lot, and staging areas; and all fencing work areas along the southern skyline ridge trail and Fifield-Cahill ridge trail. The qualified biologist shall flag active nests/dens identified within the project work areas as a sensitive resource to be avoided during construction.

- Should avoidance of active woodrat stick nests within the project site not be feasible, the nests shall be dismantled by hand under the supervision of the qualified biologist, consistent with California Department of Fish and Wildlife guidance and permits, as applicable. If young are encountered during dismantling of the nest, material shall be replaced and a 20-foot no-disturbance buffer shall be established around the active nest. The biologist shall inspect the nest at least 24 hours later to

see if the young are present. If the young are still present, the buffer shall remain in place until the woodrats have matured enough to disperse on their own accord and the nest is no longer active.

Access Program Variants 2 and 3

Access program variant 2 and variant 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate, which could directly affect woodrat nests or badger dens if they are present along the fence installation corridor. Injury or mortality could result if construction equipment or vehicles were to crush an occupied woodrat nest or badger den. For the reasons described above for the proposed access program and variant 1, the loss of woodrats or their nests or badgers or their dens would be a significant impact. Implementation of Mitigation Measure M-BI-2c, Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger, would reduce this impact to a less-than-significant level by requiring preconstruction surveys for woodrat nests and badger dens, and avoidance or relocation of nests and avoidance of dens.

Mitigation Measure M-BI-2c applies to construction of Fifield-Cahill ridge trail improvements under access program variants 2 and 3.

Mitigation Measure M-BI-2c – Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger.

(See page 4.8-72 for a description of the mitigation measure.)

Dusky-Footed Woodrat and American Badger, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Impacts from construction of project components south of S.R. 92, including the southern skyline ridge trail, would be similar to those described for the Fifield-Cahill ridge trail improvements under access program variants 2 and 3. Construction could directly affect woodrat nests, if present. Injury or mortality could result if equipment or vehicles were to crush an occupied woodrat nest. For the reasons described for the Fifield-Cahill ridge trail improvements above, the loss of woodrats or their nests or badgers or their dens would be a significant impact. Implementation of Mitigation Measure M-BI-2c, Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger, would reduce this impact to a less-than-significant level by requiring preconstruction surveys for nests/dens, and avoidance or relocation of nests and avoidance of dens.

Mitigation Measure M-BI-2c applies to construction of the southern skyline ridge trail under the proposed access program and variants.

Mitigation Measure M-BI-2c – Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger.

(See page 4.8-72 for a description of the mitigation measure.)

Special-Status and Migratory Nesting Birds and Special-Status Bats and Maternity Roosts, Fifield-Cahill Ridge Trail

Special-status bird and bat species could nest or roost in the project area. Other migratory birds and common bat species may also nest or roost. Construction activities could result in direct impacts on breeding birds and roosting bats through injury or mortality or removal of breeding or roosting habitat. Construction noise and activities could also result in incidental impacts on breeding birds and roosting bats by disrupting active breeding and roosting.

Proposed Access Program and Access Program Variant 1

Trees and shrubs throughout the project area are suitable habitat for nesting special-status and migratory birds as well as roosting special-status and common bat species. Areas with mature trees provide potential nesting or roosting habitat for the largest number of species. The proposed loop trail alignment supports large trees that could contain cavities suitable for the nests of Vaux's swift and purple martin, among other birds. These areas may also support hoary bat or fringed myotis maternity roosting sites, which are uncommon in the region. Impacts on active bat roosts are of concern to the California Department of Fish and Wildlife—particularly species of special concern. Active bat roosts therefore require protective measures to avoid direct species loss.

The removal of trees and shrubs for trail and parking lot construction would result in temporary and permanent losses of nesting habitat. Similar clearing activities for construction staging, if required, could cause the temporary loss of nesting or roosting habitat. In addition to this loss of habitat from vegetation clearing and tree removal, construction noise and human disturbance during the breeding season could cause birds or bats to abandon their nests or maternity sites, potentially resulting in mortality to young, if present. For the reasons noted above, these impacts would be significant. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts, would reduce this impact to a less-than-significant level by requiring the SFPUC to conduct preconstruction surveys, avoid active nest/roost areas with a suitable buffer, and perform bat-sensitive tree trimming.

> *Mitigation Measures M-BI-2d and M-BI-2e apply to construction of Fifield-Cahill ridge trail improvements under the proposed access program and access program variant 1.*
>
> **Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.**
>
> The SFPUC shall conduct tree and shrub removal in the project area outside the breeding season (generally August 16 through February 14) for migratory birds and raptors whenever possible. In the event that the construction schedule requires work during the breeding season, tree and shrub removal shall occur only in the absence of nesting birds.
>
> If the SFPUC conducts construction activities during the avian breeding season (February 15 to August 15), a qualified biologist experienced in identifying birds and their habitat shall conduct nesting-raptor surveys within 500 feet of construction areas (as access is allowed on adjacent private lands). The biologist shall conduct nesting songbird surveys within 150 feet of all work areas (as access is allowed on adjacent private lands) and shall map all migratory bird and active raptor nests within these areas. These

surveys shall be conducted within two weeks prior to the initiation of construction activities at any time between February 15 and August 15. If no active nests are detected during surveys, no additional mitigation is required.

If migratory bird and/or active raptor nests are found within the construction area or in the adjacent surveyed area, the SFPUC shall establish a no-disturbance buffer around the nesting location to avoid disturbance or destruction of the nest site until after the breeding season or after the biologist determines that the young have fledged (usually late June through mid-July). The biologist shall determine the extent of these buffers consistent with U.S. Fish and Wildlife Service guidelines, and buffer placement would depend on: the species' sensitivity to disturbance, which can vary among species; the level of noise or construction disturbance; the line-of-sight between the nest and the disturbance; ambient noise (baseline noise) and other disturbances under existing conditions; and consideration of other topographical or artificial barriers.

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

A qualified biologist experienced in the identification of special-status bats shall conduct a preconstruction survey for special-status bat species habitat in advance of any tree removal to identify signs of potential bat habitat, including maternity colonies and any active roost sites. Identified bat maternity colonies shall be avoided, if possible. Should potential maternity colonies, roosting habitat, or active bat roosts be found in trees but cannot be avoided, SFPUC shall ensure the following measures are implemented:

- Trim trees or install bat exclusion devices when bats are active, approximately between the periods of March 1 to April 15 and August 15 to October 15; outside of the bat maternity roosting season (approximately April 15 to August 15) if a maternity roost is present, and outside the months of winter torpor (approximately October 15 to February 28, or as determined by a qualified biologist experienced in the identification of special-status bats), to the extent feasible.

- If tree trimming is not feasible during the periods when bats are active, and bat roosts being used for maternity or hibernation purposes are found on or in the immediate vicinity of the tree trimming, a qualified biologist shall delineate a no-disturbance buffer around these roost sites until they are no longer in use as maternity or hibernation roosts or the young are capable of flight.

- Based on the professional opinion of a qualified biologist, buffer distances may be adjusted around roosts depending on the level of surrounding ambient activity (e.g., if the project area is adjacent to a road or active quarry area) or if an obstruction, such as a large rock formation, is within the line-of-sight between the nest and construction.

- A biologist experienced in the identification of special-status bats shall be present during tree trimming and disturbance to rock crevices or outcrops if bat roosts are present. Project activities shall disturb trees and rock crevices with roosts only when no rain is occurring or is not forecast to occur for three days and when daytime temperatures are at least 50 degrees Fahrenheit.

- Under the supervision of the qualified biologist, trim trees containing or suspected to contain roost sites over two days. On the first day, branches and limbs not containing cavities or fissures in which bats could roost shall be cut using chainsaws. The following day, branches or limbs containing roost sites shall be trimmed with chainsaws, under the supervision of the biologist.

Access Program Variants 2 and 3

Access program variant 2 and variant 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. Removal or trimming of trees could result in temporary or permanent loss of habitat, and construction noise and human disturbance during the breeding season could lead to nest or roost abandonment. For the reasons described above for the proposed access program and variant 1, these impacts would be significant. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts, would reduce this impact to a less-than-significant level by requiring the SFPUC to conduct preconstruction surveys, avoid active nest/roost areas with a suitable buffer, and perform bat-sensitive tree trimming.

Mitigation Measures M-BI-2d and M-BI-2e apply to construction of Fifield-Cahill ridge trail improvements under access program variants 2 and 3.

Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.

(See page 4.8-74 for a description the mitigation measure.)

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

(See page 4.8-75 for a description the mitigation measure.)

Special-Status and Migratory Nesting Birds and Special-Status Bats and Maternity Roosts, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Impacts from construction of project components south of S.R. 92, including the southern skyline ridge trail, would be similar to those described for the Fifield-Cahill trail improvements under access program variants 2 and 3. Parts of the southern skyline ridge trail support mature Douglas fir forest and contain large trees that provide potential nesting or roosting habitat for a large number of bird and bat species. Construction activities could result in temporary or permanent habitat loss, and construction noise and human disturbance during the breeding season could lead to nest or roost abandonment. For the reasons described above for the Fifield-Cahill ridge trail improvements, these impacts would be significant. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts, would reduce this impact

to a less-than-significant level by requiring the SFPUC to conduct preconstruction surveys, avoid active nest/roost areas with a suitable buffer, and perform bat-sensitive tree trimming.

Mitigation Measures M-BI-2d and M-BI-2e apply to construction of the southern skyline ridge trail under the proposed access program and variants.

Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.

(See page 4.8-74 for a description of the mitigation measure.)

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

(See page 4.8-75 for a description of the mitigation measure.)

Wildlife Corridors, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

The management plan EIR includes management actions to limit impacts on wildlife corridors or wildlife movement.[146] Aquatic habitat that provides nursery sites for California red-legged frogs, San Francisco garter snake, and numerous common amphibian and reptile species is present on both sides (i.e., east and west) of the Fifield and Cahill ridges. On the eastern side, Crystal Springs Reservoir provides high-quality emergent vegetation for egg deposition and juvenile rearing, and the Mud Dam pond in the Five Points area provides high-quality aquatic habitat for California red-legged frog, San Francisco garter snake, and other reptiles and amphibians. On the western side of the ridge, Pilarcitos Reservoir and Stone Dam pond both provide suitable aquatic habitat for California red-legged frogs and San Francisco garter snakes, and both species have been recorded on both sides of the ridge.[147] Thus, individual San Francisco garter snakes, California red-legged frogs, and other reptile and amphibian species may cross the ridgetop as they move between habitat features.[148] Mammal species, including mule deer, mountain lion, bobcat, and gray fox are also likely to use or cross Fifield-Cahill ridge trail.

Construction of the loop trail, parking areas, and other features on the Fifield and Cahill ridges under the proposed access program and access program variant 1 would be of short duration (i.e., limited to a few weeks at any given location). During this time, project activities would not preclude wildlife from using the ridge as a corridor. The ridgetop is much broader than the work area, and these animals are typically most active in the dawn and dusk hours, outside the project's proposed construction hours. Thus, project construction under the proposed access program and variant 1 would have a less-than-significant impact on wildlife corridors and movement.

146 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section II, Project Description, Table II-I, (p. II-34).

147 Yacelga, M., Stagnaro, B. and T. Lim, 2016 San Francisco Garter Snake Trapping Results (Cahill Ridge Road, Mud Dam 1, and Pilarcitos Reservoir), Letter report from BioMaAs, Inc. and AECOM to the San Francisco Public Utilities Commission, October 31, 2016.

148 Ibid.

Mitigation: None required.

Access Program Variants 2 and 3

Access program variants 2 and 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. In order to install fencing, work crews would trim an up to 6-foot-wide swath of vegetation to within 12 inches of the ground within the fencing alignment. The trimming of these areas would remove cover for amphibian, reptile, and small mammal species and would temporarily impede wildlife movement at each location. San Francisco garter snakes are active during the day and might be inhibited from crossing the ridgetop during construction but could remain in aquatic habitat on both sides of the project area. Because construction activities would be limited to a few weeks at any given location and would occur during daytime hours, wildlife would still be able to utilize the ridgetop area outside of construction hours. The area cleared of vegetation would recover within two to three months. During this period, habitat would be fragmented and mortality of small wildlife species might increase from predation in this open area. However, this effect is likely to be small, as most individuals would be able to avoid this area when exposed to predators. Thus, project construction under variants 2 and 3 would have a less-than-significant impact on wildlife corridors and movement.

Mitigation: None required.

Wildlife Corridors, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Within the portion of the project area south of S.R. 92, the trail alignment would parallel S.R. 35, a busy two-lane highway on which vehicles move at high speed. Due to the high risk of mortality, S.R. 35 represents an existing partial barrier to wildlife moving from one side of the ridge to the other; therefore, passage for snakes, amphibians, or mammal species in the east-west direction is already limited, and this condition would not change with project construction and use. However, because no trail currently exists in this area, wildlife species may nest within the alignment or use the current route to move in a north-south direction. Due to the presence of construction equipment and workers and the associated ground disturbance, trail construction activities would temporarily remove this area as habitat and limit its use as a wildlife movement corridor.

As discussed for the Fifield-Cahill ridge trail improvements, construction-related impediments to wildlife movement would be temporary and confined to daytime hours, when most animals are less active. Clearing of vegetation for trail construction and trimming of vegetation for fencing would remove cover in this area for two to three months, potentially resulting in limited fragmentation of habitat and increasing mortality of small animals from predation. However, this effect is expected to be minor due to the small area affected. Thus, construction and operation of the southern skyline ridge trail and associated amenities would not substantially interfere with

wildlife corridors or the movement of native resident or migratory wildlife species. As a result, the impact would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail could result in significant impacts related to special-status wildlife. Implementation of Mitigation Measures M-BI-1c, M-BI-1d, M-BI-2a, M-BI-2b, M-BI-2c, M-BI-2d, and M-BI-2e would reduce impacts on special-status wildlife to a less-than-significant level. Project construction along the southern skyline ridge trail could result in significant impacts related to special-status wildlife. Implementation of Mitigation Measures M-BI-1d, M- BI-2a, M-BI-2c, M-BI-2d, and M-BI-2e would reduce impacts on special-status wildlife to a less-than-significant level. For the reasons presented, construction of the project with the proposed access program would have a less-than-significant impact on special-status wildlife with implementation of the recommended mitigation.

Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands. (Less than Significant with Mitigation)

The management plan EIR considers the potential effects of project construction on sensitive natural communities, including riparian habitat and wetlands. The document concludes potential effects of construction could be significant and recommends Program-Level Mitigation Measures E.1 and E.2 and Project-Level Mitigation Measures 1 through 3 to reduce those impacts.[149] The measures call for a variety of preconstruction site assessments, avoidance of sensitive habitat areas, development of a vegetation management plan, and resource monitoring, among other measures. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on sensitive natural communities and of the efficacy of the previously identified mitigation. Accordingly, the management plan EIR mitigation measures have been updated and refined in this EIR based on consideration of this new information and changes to the status and distribution of sensitive natural communities.

Table 4.8-6 presents a summary of the project's estimated temporary and permanent impacts on vegetation communities, including sensitive natural communities, based on the mapped vegetation in the project area.

[149] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-6 (p. III.E-32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI, Natural Resources (p. VI-3 and VI-4).

Sensitive Natural Communities—Upland Vegetation, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

The California Department of Fish and Wildlife identifies coast redwood and tanoak forest as sensitive natural communities. The Peninsula Watershed Management Plan originally designated portions of the proposed work areas as high ecological sensitivity zones because they were mapped as old-growth Douglas fir forest using a coarse-scale vegetation map. However, new SFPUC analysis, including a site visit, indicates that the areas are not old-growth forest and are therefore not considered sensitive.[150] Under the proposed access program and variant 1, some construction activities along the Fifield-Cahill ridge trail, such as staging, access, and grading, including removing 10-15 trees, would occur in Douglas fir forest, but not coast redwood or tanoak forest. Therefore, no impacts on sensitive natural upland communities would occur along the Fifield-Cahill ridge trail under the proposed access program and access program variant 1 (see Section 4.8.2.6, *Sensitive Natural Communities*).

Mitigation: None required.

Access Program Variants 2 and 3

Access program variant 2 and variant 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. The proposed fencing routes would generally be within about 50 feet of the trail centerline, but may be located closer or farther depending on site-specific considerations. Workers would install the fencing using hand tools, power tools, or truck-mounted equipment and would trim vegetation to within 12 inches of the ground surface, either by hand or mechanically, to accommodate fence installation. No substantial topsoil disturbance is expected from this vegetation trimming. Vegetation would be allowed to regrow after fence installation and would not be maintained in a cleared condition.

Work associated with fence construction under variants 2 and 3 (i.e., off-trail vegetation trimming, vehicle and foot traffic, and limited ground disturbance) could cause approximately 1.27 acres of temporary impact on sensitive natural communities, including approximately 1.19 acres within old-growth forest habitat (although old-growth trees would not be removed and disturbance would be limited to vegetation reductions within sparsely vegetated understory areas) and up to 0.08 acre of grassland (see Table 4.8-6).[151] The Peninsula Watershed Management Plan indicates that grasslands along Fifield and Cahill ridges may include the sensitive needlegrass grassland and serpentine bunchgrass habitat types, although these areas are sometimes mapped as annual grassland. The above-described fencing installation work could result in trampling and/or trimming needlegrass and bunchgrass, if present within the fencing alignment. In addition to tree removal (approximately 40-45 trees, or two more per fence mile than for the proposed access program and variant 1), temporary effects in some forested

[150] San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Spring 2002, p. 5.9-5; ESA+Orion, Southern Skyline Ridge Trail Extension Project, Ridge Trail Site Review Meeting Summary, November 5, 2018.

[151] See Chapter 2, Project Description, Table 2-1, of this EIR.

communities could include surface disturbance from vehicle activity and removal of limbs to facilitate vehicle access.

For the reasons described above for the proposed access program and variant 1, the temporary loss of up to 1.27 acres of sensitive natural communities along the Fifield-Cahill ridge trail under access program variants 2 and 3 would result in a substantial adverse effect on sensitive natural communities, which would be a significant impact. Implementation of Mitigation Measure M-BI-3, Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities, would reduce this impact to a less-than-significant level by requiring the SFPUC to conduct surveys to identify and minimize impacts on sensitive natural communities within proposed construction footprints, to relocate the work area and fencing so that any sensitive natural communities are avoided to the extent feasible, and to site staging and access areas to avoid or minimize impacts on sensitive natural communities.

Mitigation Measure M-BI-3 applies to construction of Fifield-Cahill ridge trail improvements under access program variants 2 and 3.

Mitigation Measure M-BI-3 – Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities.

- Prior to start of construction, the extent of sensitive natural communities within the work area shall be surveyed by a qualified botanist experienced in the definition and recognition of the sensitive natural communities in this region, as a basis for avoiding and minimizing impacts on sensitive natural communities. The outer dripline of the tree canopy in Douglas fir forest, redwood forest, and tanoak forest shall be defined as the limits of the natural community; areas currently managed as fuelbreaks shall not be considered part of the extent of sensitive natural communities. SFPUC shall carry out an as-built survey after the project is completed to document the extent of permanent and temporary impacts on sensitive natural communities.
- Within old growth Douglas fir forest, redwood forest, and tanoak forest, SFPUC native trees whose dripline extends within the work area shall be protected using best practices to minimize impact on roots and for cutting roots, when necessary, to minimize the potential to weaken trees and spread disease. SFPUC shall ensure the following actions are implemented during construction within sensitive natural communities to protect native trees:
  - A certified arborist or qualified ecologist shall assist in tree protection planning, monitoring, and follow-up maintenance as needed to protect trees.
  - Barriers or sturdy fencing shall be used around individual trees or groups of trees that require protection to define and protect critical root zones near work areas.
  - Excavation and ground disturbance shall be minimized within the critical root zone (i.e., within the tree dripline).
  - Construction shall avoid cutting tree roots over 4 inches in diameter, and any necessary cuts shall be made cleanly with sharp tools to encourage wound closure and confine the spread of decay.

  - To avoid compacting soils during construction in sensitive natural communities, no parking of cars, trucks, or heavy equipment shall occur within the critical root zone.

- The SFPUC shall compensate for temporary and permanent impacts on sensitive needlegrass grassland and serpentine bunchgrass natural communities by revegetation, wherever feasible, as part of Mitigation Measure M-BI-1c.

Sensitive Natural Communities—Upland Vegetation, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Construction activities for the project components south of S.R. 92, including staging, access, grading, paving, drainage and fencing, would occur in coast redwood and tanoak forest habitat. For the same reasons described above for sensitive natural communities along the Fifield-Cahill ridge trail improvement areas, these activities could result in both temporary and permanent loss of these natural communities, each of which is identified as sensitive by the criteria set forth in Section 4.8.2.6, *Sensitive Natural Communities*. Coast redwood forest and tanoak forest are present in the southern 0.8 mile of the proposed southern skyline ridge trail alignment within an area that is partially managed as a fuelbreak. Approximately 3 acres of coast redwood forest would be temporarily affected by construction, while 0.73 acre would be permanently affected. Up to 0.65 acre of tanoak forest would be temporarily affected by construction, while 0.1 acre would be permanently affected (see Table 4.8-6). Up to two trees per fence mile (about 30 trees) could be removed from these vegetation communities, but the exact number within each community type is not known.

The project could also affect sensitive natural communities (tanoak and coast redwood forest) by damaging the root zone of mature trees near the work areas, especially coast redwoods, which have a shallow root system. Such damage causes stress to the plants and opens an entry point for pathogens. Excavations for the southern skyline ridge trail (up to 15 inches) and the access drives (to 9 inches) could encounter the tree root zones. Any root damage within coast redwood forest and tanoak forest that could weaken trees and spread disease, and any temporary or permanent loss of these sensitive natural forest communities would be a significant impact.

Implementation of Mitigation Measure M-BI-3, Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities, would reduce this impact to a less-than-significant level by requiring the SFPUC to conduct surveys to identify and minimize impacts on sensitive natural communities within proposed construction footprints; relocate the work area and fencing so that any sensitive natural communities are avoided to the extent feasible; and site staging and access areas to avoid or minimize impacts on sensitive natural communities.

Mitigation Measure M-BI-3 applies to construction of the southern skyline ridge trail under the proposed access program and variants.

Mitigation Measure M-BI-3 – Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities.

(See page 4.8-81 for a description of the mitigation measure.)

Sensitive Natural Communities—Wetlands and Riparian Areas, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Construction of the project would not affect any riparian habitat. During the initial project design phase, the SFPUC identified three small wetland and/or drainage features ("wetlands") within the project area, one of which occurs near the Fifield-Cahill ridge trail in the vicinity of the proposed loop trail. As discussed in Chapter 2, Project Description, the SFPUC rerouted the loop trail to avoid this wetland and has proposed a specialized construction approach for the trail segments in the vicinity of these wetlands (see Section 2.6.5, Avoidance of Wetlands and Bridge Installation and Figure 2-4,). This specialized approach would include conducting a preconstruction survey to determine the exact extent of the wetland boundaries; erecting fencing and signage along the portions of the wetlands adjacent to work areas to prevent unnecessary encroachment into the wetlands; installing erosion and sediment control measures, such as fiber rolls and silt fences, around the work areas; increasing the frequency of environmental inspection and monitoring; providing construction personnel training; and using smaller equipment, such as the Toro Dingo or similar compact utility vehicle, portable vibratory compacting equipment, and hand tools for near-wetland trail construction.

Through trail realignment and implementation of the above-described measures, construction activities in the vicinity of these features are not expected to result in adverse effects on wetlands, riparian areas, or other waters.

Therefore, construction of the project under the proposed access program and variant 1 along the Fifield-Cahill ridge trail would result in a less-than-significant impact with regard to wetlands and riparian areas. Section 4.10, Hydrology and Water Quality, provides additional discussion of potential impacts on wetlands and seasonal drainages.

Mitigation: None required.

Access Program Variants 2 and 3

Access program variants 2 and 3 include the same project components and would result in the same construction impacts identified above for the proposed access program and access program variant 1. In addition, under variants 2 and 3, the SFPUC would construct fencing along Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate (inclusive of the loop trail), but has not conducted wetland surveys within the proposed fencing alignment. However, as described above for the proposed access program and variant 1 (including the specialized construction approach described in Chapter 2, Project Description), the project fencing alignment would be routed to avoid wetland features. Therefore, construction of variants 2 and 3 along the Fifield-Cahill ridge trail would result in a less-than-significant impact related to wetlands and riparian areas. Section 4.10, Hydrology and Water Quality, provides additional discussion of potential impacts on wetlands and seasonal drainages.

Mitigation: None required.

Sensitive Natural Communities—Wetlands and Riparian Areas, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Construction of the project would not affect any riparian habitat. During the initial project design phase, AECOM identified a seasonal drainage approximately 1.25 miles south of the proposed trailhead of the southern skyline ridge trail (Chapter 2, Project Description, Figure 2-3b); a wetland (with an associated seasonal drainage) to the south of the seasonal drainage (Figure 2-3c); and another (non-associated) seasonal drainage farther south (Figure 2-3d) along the proposed southern skyline ridge trail corridor.[152] At the northernmost drainage, the SFPUC would install a prefabricated bridge, with footings in upland areas, outside of the drainage. In order to avoid affecting the second wetland feature, the SFPUC designed the trail alignment to follow an upland berm between the features, thereby avoiding the wetland and associated drainage feature. However, as also shown in Chapter 2, Figure 2.3c, fencing would still need to be sited within the wetland immediately adjacent to the trail because of the topography, vegetation, and wetland extent at this location (see Chapter 2, Section 2.6.5, Avoidance of Wetlands and Bridge Installation). Fencing construction would require up to approximately four 3-inch line posts and eight 1.5-inch T-posts to support barbed-wire fencing in the wetland area. Work crews would install the posts and fencing using hand tools at this location. As shown in Figure 2-3d, the SFPUC would not construct trail improvements within approximately 8 feet of the third seasonal drainage that lies to the south of the wetland noted above.

In addition, the SFPUC has proposed a specialized construction approach for the trail segment situated near the wetlands and seasonal drainages. This specialized approach would include conducting a preconstruction survey to determine the exact extent of the wetland boundaries; erecting fencing and signage along the portions of the wetlands adjacent to work areas to prevent unnecessary encroachment into the wetlands; installing erosion and sediment control measures, such as fiber rolls and silt fences, around the work areas; increasing the frequency of environmental inspection and monitoring; providing construction personnel training; and using smaller equipment, such as the Toro Dingo or similar compact utility vehicle, portable vibratory compacting equipment, and hand tools for near-wetland trail construction. The SFPUC would include these measures in the project's bid specifications and make them a requirement of the construction contract (see Chapter 2, Section 2.6.5, Avoidance of Wetlands and Bridge Installation, for additional description.)

Through trail realignment and implementation of the above-described measures, construction activities in the vicinity of these features are not expected to result in substantial adverse effects on wetlands or drainages. Although the exact location of the barbed-wire fencing proposed for the southern skyline ridge trail has not been surveyed, the fencing installation would avoid substantial impacts on wetlands through implementation of the specialized construction approach. Therefore, for the reasons presented above, construction of all access programs along the southern skyline ridge trail would result in less-than-significant impacts on wetlands or

[152] AECOM, *Draft Natural Environment Study*, July 2017.

riparian areas. Section 4.10, Hydrology and Water Quality, provides additional discussion of impacts on wetlands and seasonal drainages.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail would result in less-than-significant impacts on sensitive natural communities. Construction of the proposed access program along southern skyline ridge trail could result in significant impacts on sensitive natural communities. Implementation of Mitigation Measure M-BI-3 would reduce these to a less-than-significant level. For the reasons presented, construction of the project with the proposed access program would have a less-than-significant impact on sensitive natural communities with implementation of the recommended mitigation.

Analysis of Operational Impacts on Special-status Plants and Animals, and Sensitive Natural Communities

Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants. (Less than Significant with Mitigation)

The management plan EIR considers the potential effects of project operation on special-status plants. The document concludes that potential effects of operation could be significant and recommends Program-Level Mitigation Measures E.1 and E.2 and Project-Level Mitigation Measures E.1 through E.3 to reduce those impacts.[153] The measures call for a variety of preconstruction site assessments, avoidance of sensitive habitat areas, development of a vegetation management plan, and resource monitoring. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on special-status plants and of the efficacy of the previously identified mitigation. Accordingly, the management plan EIR mitigation measures have been updated and refined in this EIR based on consideration of this new information and changes to the status and distribution of special-status plants.

Impacts from visitor use and maintenance on the spread of invasive plants and plant pathogens are discussed under Impact BI-7. Impacts from tree removal are discussed under Impact BI-8.

Fifield-Cahill Ridge Trail

As discussed for Impact BI-1, the SFPUC regularly uses and maintains (e.g., driving on, mowing, patching) the Fifield-Cahill ridge trail, and the trail receives a fair amount of visitor (i.e., pedestrian, bicyclist, equestrian) use. In addition, SFPUC staff also manages wildfire risk along portions of the trail by tree maintenance and vegetation clearing, as needed, typically on four-

[153] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-6 (p. III.E-32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI, Natural Resources (pp. VI-3 and VI-4).

year intervals.[154] As explained in Chapter 2, Project Description, Section 2.7.2.2, *Vegetation Maintenance*, the SFPUC would continue to conduct surveys for rare plants prior to mowing along Fifield-Cahill ridge trail, and map and flag for avoidance any rare plants identified. However, these surveys are limited to the mowed areas and may not be appropriately timed for identifying all rare plants that could occur along the ridge trail.

Proposed Access Program and Access Program Variant 1

A population of Franciscan onion grows along a portion of the Fifield-Cahill ridge trail, and suitable habitat is present for other species for which surveys have not been carried out, such as coastal triquetrella (see Figure 4.8-2). The SFPUC has not documented any adverse effects on special-status plants resulting from the above-described maintenance and visitation activity occurring under the existing docent program.

Operation of the project under the proposed access program and access program variant 1 would result in visitor use that is similar to baseline conditions within the Fifield-Cahill ridge trail portion of the project area. Continued docent-led activities would be similar to existing supervised uses of the service road, with a potential increase in visitation on one additional day per week if enough docents are available to accommodate visitor demand. Therefore, because it would not result in a substantial change in trail use compared to existing conditions, the proposed operation of the Fifield-Cahill trail under the proposed access program and variant 1 would have a less-than-significant impact on special-status plants.

Mitigation: None required.

Access Program Variants 2 and 3

As noted previously, the Fifield-Cahill ridge trail is subject to various uses and activities under existing conditions, including mowing, fuel management, road maintenance, watershed operations vehicle traffic, and pedestrian, bicycle, and equestrian trail use. Under existing conditions, the edges of the road and even the center of the road are well vegetated in some locations. Unsupervised access under variants 2 and 3 is expected to result in greater visitation than under existing conditions. As described in Chapter 2, Project Description, Section 2.5, Project Components, annual visitation is estimated to be up to 50,000 people under variants 2 and 3, as compared to about 870 people currently. Increased visitor traffic under access variants 2 and 3 could trample and crush existing vegetation, and/or compact the underlying soil, within maintained portions of the trail, thereby reducing the density of vegetation in these areas. As discussed in Section 4.8.2, Environmental Setting, Franciscan onion and western leatherwood are reported as occurring on the edges of the Fifield-Cahill ridge trail. In addition, suitable habitat is present for coastal triquetrella along this trail, although surveys have not been conducted for this species. Each of these plants is a California Native Plant Society list 1B.2 species.[155] Additional

[154] John Fournet, Community Liaison, SFPUC, Vegetation maintenance along Fifield-Cahill ridge trail (file note), May 12, 2017.

[155] According to the California Native Plant Society: "Plants with a California Rare Plant Rank of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century." A 0.2 "threat rank" means that a plant is "moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)."

special-status plants also have potential to be present in grassland or roadside habitat, including bent-flowered fiddleneck, San Francisco collinsia, Point Reyes horkelia, arcuate bush mallow, Choris' popcorn flower, and woodland woollythreads, although these species have not been recorded in past surveys. With increased visitor traffic along the trail, rare plants and suitable habitat could be trampled.

In the absence of rare plant surveys of all portions of the project alignment that are appropriately timed for the rare plants that could be present within the potentially affected areas, the potential for some loss of special-status plants cannot be entirely ruled out or quantified at this time. Therefore, this EIR conservatively assumes these species could be present, and that increased visitation under access program variants 2 and 3 could result in direct loss of special-status plant species or their habitats, which would be a significant impact.

User rules, which would be posted on signs at trailheads and communicated by SFPUC staff and volunteers, would specify that visitors are to remain on the designated trails, and the trail areas would be enclosed in barbed-wire fencing; see section 2.7.1.3, *Access Program Variant 2* (*Unsupervised/Unrestricted Access*), above. Moreover, visitation under variant 3 would be subject to a permit program, and permittees would be required to undergo an educational training program that addresses sensitive resources of the watershed and watershed rules. With relatively fewer visitors under variant 3 and anticipated greater visitor adherence to watershed rules, potential impacts on special-status plants would be incrementally less than under variant 2.

As indicated in a recent survey of recreational land managers in the project vicinity, some visitors are expected to venture off trail under unsupervised access.[156] Off-trail usage may occur in areas where visitors wish to obtain better views, in attractive areas for stopping, or where users wish to create informal trails. These types of off-trail usage could result in damage to special-status plants, either directly as visitors trample and crush these plants or indirectly through soil compaction; the spread of invasive plants, which could change the local species composition; or through erosion in unvegetated areas. Any combination of these activities could result in significant impacts on special-status plants.

Responses to the survey of recreational land managers showed that, overall, agencies have curbed significant adverse impacts stemming from improper uses by posting educational signage, installing fencing and physical barriers, performing regular maintenance, and conducting daily patrols and enforcement. Moreover, operations under proposed access variants 2 and 3 would incrementally increase use of the existing Fifield-Cahill trail over existing public use under the docent-led program (approximately 50,000 annual users compared to 1,000) and increase existing maintenance, which includes daily use by SFPUC trucks and annual mowing. Nonetheless, in and on the verge of the trail, impacts could increase on special-status plant species such as western leatherwood, Franciscan onion, coastal triquetrella, Choris' popcorn flower, or any other species known or with the potential to occur near the trail alignment. Such impacts would be more likely with increases in visitor numbers and fewer use restrictions. Accordingly, the potential for such impacts would be greater under access program variant 2

[156] ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.

than variant 3. The potential for substantial adverse effects on special-status plants during operations is considered low, given existing trail uses, as well as the annual pre-mowing botanical surveys, which help protect identified rare plants and reduce the likelihood of undiscovered rare plants along the trail. However, in the absence of appropriately timed rare plant surveys of all portions of the project alignment, this EIR conservatively concludes that implementation of access program variants 2 and 3 along the Fifield-Cahill ridge trail could result in substantial adverse effects on special-status plant species and/or their habitats, which would be a significant impact.

Implementation of Mitigation Measures M-BI-1a, Avoidance Measures for Special-Status Plant Species, and M-BI-4, Operational Measures to Protect Sensitive Plant Species, would reduce these impacts to a less-than-significant level by requiring appropriately timed and located special-status plant surveys, the establishment of protective buffers, ongoing monitoring to detect changes in special-status plant populations near the trail, evaluation of whether trail usage contributes to population decline, and avoidance and minimization measures to protect the plant populations. Measure M-BI-4 includes a suite of measures to protect a range of potentially affected special-status species in the watershed, including wildlife and plants, and is recommended accordingly to mitigate other impacts identified elsewhere is this section. In addition, as described in Chapter 2, Project Description, Section 2.5, Project Components, the SFPUC would lock trail entrance gates to prevent unauthorized afterhours access, to further reduce this potential impact.

Mitigation Measures M-BI-1a and M-BI-4 apply to operation of the Fifield-Cahill ridge trail under access program variants 2 and 3.

Mitigation Measure M-BI-1a – Avoidance Measures for Special-Status Plant Species.

(See page 4.8-50 for a description of the mitigation measure.)

Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.

- The SFPUC shall annually survey and monitor special-status plants within 20 feet of the Fifield-Cahill ridge trail, loop trail, and southern skyline ridge trail centerline to detect changes in population size, location, and vigor. If population decline is recorded during annual monitoring and the surveyors determine trail usage or unauthorized off-trail appears to be a contributing factor, the SFPUC shall protect the population and reduce the impact of trail usage by implementing measures such as additional fencing, signage, increased enforcement, rerouting the road or trail, translocation or reseeding, returning to docent-led access, or seasonal trail closure. The SFPUC shall monitor and enforce protection of special-status plant populations for 10 years or until monitoring demonstrates that trail use has no substantial effect on year-over-year plant vigor or plant population numbers, whichever is longer.
- The SFPUC shall provide informational signage to educate the public concerning potential recreational impacts on native vegetation, including sudden oak death and other *Phytophthora* spp.
- The SFPUC shall regularly inspect trail fencing (e.g., weekly or monthly) and promptly repair damage (e.g., quarterly) in order to maintain fencing integrity and prevent off-trail use.

- All motorized vehicles shall maintain a speed limit of 15 miles per hour within the project area (10 miles per hour at Five Points) at all times to avoid harm to sensitive species.
- The SFPUC shall provide closed (wildlife-proof) garbage containers at trailhead parking areas for the disposal of trash items (e.g., wrappers, cans, bottles, food scraps) and empty them daily. The SFPUC shall scan the project area for litter during daily sweeps.

Southern Skyline Ridge Trail

All Access Programs

Visitor use could result in vegetation impacts similar to those described for the Fifield-Cahill ridge trail. However, as discussed for Impact BI-1, no special-status plants were observed during botanical surveys of the proposed construction zone, which encompasses a larger area than the completed trail footprint. As a result, potential operational impacts on special-status plants in the southern skyline ridge trail area would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project with the proposed access program along the Fifield-Cahill ridge trail and along the southern skyline ridge trail would result in less-than-significant impacts related to special-status plants. No mitigation is required.

Impact BI-5: Project operations could result in substantial adverse impacts on special-status wildlife. (Significant and Unavoidable with Mitigation)

The management plan EIR considers the potential effects of project operation on special-status wildlife, noting that unsupervised public use poses potentially significant risks to wildlife, including disturbance from off-trail activity, habitat trampling, and dog attacks on wildlife.[157] It also explains that visitor use under an unsupervised access program could put San Francisco garter snake, California red-legged frog, and other species at risk of being crushed by bicycles, horses, or patrol vehicles.[158] Additional potential visitation impacts identified in the management plan EIR include an increased spread of invasive plants, ignition of human-caused fires that damage habitat, and the illegal collection of San Francisco garter snakes—which was a historic driver in the decline of the species and remains a threat.[159]

To mitigate for potential impacts from unsupervised use on San Francisco garter snake, California red-legged frog, and other terrestrial species that may occur on trails in the watershed,

[157] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (p. V-27).
[158] Ibid.
[159] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (pp. V-27 and V-28).

the management plan EIR recommends implementation of Project-Level Mitigation Measures E.4 through E.8, which include fencing along the trail edge through sensitive habitats; seasonal access restrictions; and increased surveillance, monitoring, and enforcement of visitor use and rules in sensitive areas.[160] SFPUC staff did not implement these mitigation measures because the management plan's unsupervised public access option was not selected.

Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on special-status wildlife and of the efficacy of the previously identified mitigation. Accordingly, the management plan EIR mitigation measures have been refined in this EIR based on consideration of this new information and changes to the status and distribution of special-status wildlife species. San Francisco garter snake and California red-legged frog still have high potential to occur near the Fifield-Cahill ridge trail, particularly in the vicinity of Mud Dam and Five Points.[161]

San Francisco Garter Snake, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Project operations under the proposed access program and access program variant 1 would include docent-led visitation and maintenance of project components, including additional mowing for the new universal access loop trail. As discussed for Impact M-BI-2, most snakes are expected to remain near pond foraging habitats and wintering upland sites, although a limited number of snakes could be present near aquatic sites, such as between Pilarcitos Reservoir and Mud Dam pond, or between Lower Crystal Springs Reservoir and Pilarcitos Creek. As under existing conditions, San Francisco garter snakes moving through the project area during operations could be harmed by vehicles, equipment, or maintenance workers, who could crush snakes on the trail during vegetation maintenance or other maintenance activities. Similar to current docent-led access, it is unlikely under the proposed access program and variant 1 that docent-led trail users would accidentally step on or harm a San Francisco garter snake because docents would be able to identify any special-status species, such as this garter snake, and ensure that the trail users avoid them. In addition, docents would eliminate the possibility of visitors illegally collecting garter snakes—a major threat to this species.

The risk of snake injury or mortality during routine guided use or maintenance activities involving vehicles and equipment is considered low. The SFPUC has not recorded the take of any San Francisco garter snakes during the 14 years of docent-led public access along the Fifield-Cahill ridge trail, during annual mowing for fuelbreaks along the ridge trail or associated trail use by maintenance vehicles.[162] A review of CNDDB records, an official state repository of special-status species sightings, similarly shows no evidence of SFGS take in nearby recreational lands.[163] Thus, as

[160] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.E, Natural Resources (pp. VI-3 and VI-4).
[161] Yacelga, M., Stagnaro, B. and T. Lim, 2016 San Francisco Garter Snake Trapping Results (Cahill Ridge Road, Mud Dam 1, and Pilarcitos Reservoir), Letter report from BioMaAs, Inc. and AECOM to the San Francisco Public Utilities Commission, October 31, 2016.
[162] Lukins, Jeremy G., SFPUC, e-mail correspondence with Ellen Natesan, SFPUC, re: California Red-Legged Frog, May 16, 2019.
[163] California Department of Fish and Wildlife, California Natural Diversity Database, accessed January 12, 2017.

demonstrated for the baseline condition, the proposed incremental increase in docent-led visitor use would have less-than-significant impacts on San Francisco garter snake related to human disturbance and interactions with vehicles or equipment. As a result, under the proposed access program and variant 1, impacts on San Francisco garter snake would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Project operations under access program variants 2 and 3 would include the same types of facilities maintenance activities described for the proposed access program and variant 1. However, project area visitation is expected to increase under variants 2 and 3 (estimated at up to 50,000 people under variant 2—a fifty-fold increase over current levels—with a smaller increase under variant 3), resulting in a commensurate increase in watershed facility maintenance, monitoring, and patrols.

The management plan EIR notes the possibility for losses of San Francisco garter snakes as a result of maintenance vehicles and trail users.[164] Maintenance actions, monitoring, and staff supervision under variants 2 and 3 would be similar, although more frequent, than those described for the proposed access program and variant 1. However, these management actions would not result in significant impacts on San Francisco garter snake.

While most trail users would be expected to follow watershed rules, some visitors might engage in unauthorized off-trail activity in the absence of direct docent supervision. As discussed for operational impacts on rare plants, a survey of other recreational land managers showed that, overall, agencies have curbed significant adverse impacts stemming from improper uses through educational signage, fencing and physical barriers, regular maintenance, and daily patrols. The SFPUC would implement many of these actions as a means for maintaining the integrity of conditions within the Peninsula Watershed. These project features are described in Chapter 2, Project Description, and include lockable gates (Section 2.5, Project Components), trained volunteers (Section 2.7.1, Trail Access Management Program and Visitation), and security patrols (Section 2.7.2, Trail and Facilities Operations and Maintenance), and their implementation would reduce potential impacts on San Francisco garter snake.[165]

Variant 2 could result in intensified bicycle and horse traffic that could increase the likelihood of injury to San Francisco garter snake. Variant 2 could also result in intensified off-trail travel.[166] Associated effects on San Francisco garter snake could include the loss and degradation of upland habitat between the fences on the Fifield-Cahill ridge trail. Without trained docents, unsupervised visitation would increase the potential for direct impacts (e.g., trampling and crushing of San Francisco garter snakes by pedestrians, bicycles, and equestrians) and indirect impacts (i.e., damage to vegetation providing habitat for this species).

164 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources.
165 ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.
166 Ibid.

Under variant 3, the educational component of the permit program would increase visitors' awareness of San Francisco garter snake and its habitat, and thus could reduce the potential for harm relative to variant 2. In addition, with comparatively fewer visitors under variant 3 and the anticipated greater adherence to watershed rules, overall impacts on San Francisco garter snake would be incrementally less than under variant 2. However, trail users, particularly bicyclists and equestrians, could encounter and harm San Francisco garter snakes under variants 2 and 3, particularly near the Five Points area along Fifield-Cahill ridge trail, which would be a significant impact.

Implementation of Mitigation Measures M-BI-5a, Protection of Special-Status Wildlife during Operations; M-BI-5b, Additional Biological Protections for Unsupervised Access; and M-BI-5c, Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians, would reduce this impact by requiring limited operational hours, posting speed limits for visitors, and providing informational signage, enforcement, and mitigation for disturbance to upland dispersal habitat. In addition, as described in Chapter 2, Project Description, Section 2.5, Project Components, and Section 2.7, Project Operations and Maintenance, the SFPUC would lock trail entries to prevent unauthorized afterhours access that could put users in conflict with San Francisco garter snakes and would patrol the areas after trails are closed. However, in the absence of supervision from trained docents, it cannot be concluded with certainty that all visitors would comply with speed limits, check-in/monitoring systems, and other instructional signage intended to protect this special-status species. Because the San Francisco garter snake is listed as federally endangered, the SFPUC would be required to obtain a federal permit under the Endangered Species Act for activities that would result in a take of this species. However, the snake is also a California Fully Protected species, indicating that no take of the species can be authorized. Any take of San Francisco garter snake would be a significant impact; thus, under variants 2 and 3, this impact would be significant and unavoidable with mitigation.

Mitigation Measures M-BI-5a, M-BI-5b, and M-BI-5c apply to operation of access program variants 2 and 3 along the Fifield-Cahill ridge trail.

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

- The SFPUC shall limit public use of the trail system to 9 a.m. to 4 p.m. in winter (pacific standard time), and 8 a.m. to 6 p.m. in summer (pacific daylight time), to avoid periods when wildlife are most active and minimize human-wildlife conflicts.
- The SFPUC shall provide interpretive signage to educate the public concerning potential recreational impacts on special-status and native wildlife. Topics shall include the protection of listed butterflies, marbled murrelet, San Francisco garter snake, and California red-legged frog, the importance of properly disposing food trash, and the need to avoid butterfly host plants. The SFPUC shall educate the public on the dangers of trampling, intentional or unintentional feeding of park wildlife, and harassment through observation or pursuit.
- Each spring, the SFPUC shall demarcate the locations of butterfly host plants. Along the trail edge in the vicinity of these plants, Carsonite brand fiberglass composite or equivalent markers shall be installed to indicate the habitat that visitors and

maintenance traffic should avoid. The SFPUC shall monitor and maintain these markers throughout the year to protect all phases of the butterfly life cycle.

- During operations, the SFPUC shall regularly monitor and hand-clear non-native invasive plants and all shrubs from grassland habitat along the Fifield-Cahill ridge trail that supports butterfly larval host plants (i.e., select areas from Portola Gate to approximately 1.5 miles farther south) to limit the encroachment of native and non-native invasive species on butterfly host plants. The SFPUC shall treat any trampling that causes the loss of host plants as the take of a listed butterfly and shall provide mitigation as described below in Mitigation Measure M-BI-5b, via habitat enhancement or contribution to habitat restoration in areas that support San Bruno elfin butterfly and/or Mission blue butterfly, such as at San Bruno Mountain.

- The SFPUC shall continue to conduct annual breeding-season monitoring for:

  – Murrelets, as described in Avocet Research Associates:[167]

    - Conduct nesting season flyover surveys over multiple sequential days in the Pilarcitos Watershed to estimate the number of breeding murrelets.

  – Listed butterflies, as described in Arnold, Richard A., Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed, prepared for San Francisco Public Utilities Commission, December 2016, as follows:

    - Conduct surveys to visually monitor the life stages of both endangered butterflies at all of the same Ridge Trail study sites studied since 2004.

    - Regularly inspect all the foodplant locations that are part of the Ridge Trail study sites for signs of trampling or other damage, and take measurements of the area of foodplant at each location.

    - Conduct presence-absence butterfly and foodplant surveys along other service roads and off-road locations throughout the entire watershed that were identified by the Geographic Information System-based models created to predict the potential occurrences of the lupine or stonecrop larval foodplants.

Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.

- The SFPUC shall post informational signage at trailheads explaining the presence of endangered species and/or their habitat and the importance of preserving host plants as habitat for endangered butterflies. The signs shall provide speed limits to slow bicyclists and shall explain the need to avoid closed areas and roped-off plants and to use care in traversing sensitive habitat areas.

- If population decline is recorded during annual surveys and the surveyors determine trail usage or unauthorized off-trail use appears to be a contributing factor, the SFPUC shall monitor the population and implement protective measures in order to reduce the impacts of trail usage. Protective measures may include additional

[167] Avocet Research Associates, *Protocol-level Nesting Season Surveys for the Marbled Murrelet (Brachyramphus marmoratus)*, San Francisco Public Utilities Commission Lands, Upper Pilarcitos Creek, San Mateo County, California, 2018.

fencing, signage, increased enforcement, rerouting the road or trail, returning to docent-led access, or seasonal trail closure.

- To compensate for the loss of listed butterfly host plants due to trampling, the SFPUC shall clear existing host plant patches or nearby bare areas on the Peninsula Watershed of invasive competitor species and shrubs and reseed the areas to improve habitat and encourage butterfly use. Specifically, the SFPUC shall collect and scatter lupine seeds within the existing host plant patches or nearby bare areas at a 2:1 ratio to lost host plant acreage, or as otherwise required by the U.S. Fish and Wildlife Service. The SFPUC shall monitor sites in accordance with the success parameters provided by Mitigation Measure M-BI-1c.
- Whether on or off the site, restoration sites shall be chosen based on several factors including:
  - Size of the mitigation area, with large contiguous areas of habitat preferred over small, separated areas
  - Demonstrated nearby species use or occupancy
  - Overall habitat suitability and quality
  - Proximity of the mitigation area to the lupine impact site
  - The presence of appropriate soils and environmental conditions to support target plant species
  - The absence of long-term impact mechanisms or threats to successful restoration
- Alternatively, the SFPUC may fund butterfly habitat restoration in an equivalent area, based upon the 2:1 ratio of restoration to lost host plant acreage at the San Bruno Mountain Habitat Conservation Plan implementing agency, or other existing comparable restoration initiative or program permitted by the U.S. Fish and Wildlife Service for Mission blue butterfly.
- The SFPUC shall continue annual monitoring (Arnold, 2016) and use the findings to assess the impacts of increased visitation on sensitive species, butterfly host plants, and vegetation communities and allow for adaptive management. If visitation shows a significant impact on vegetation, such as host plant trampling or reduction in plant numbers, the SFPUC shall consider additional actions such as supplementary educational signage; additional flagging; more frequent maintenance, security patrols, and increased enforcement; increased seasonal restrictions; or reversion to more restricted access (such as permit or docent only).
- In the Five Points area, the SFPUC shall install signage designating a speed limit of 10 miles per hour within 1,000 feet of the intersection, and may install road striping or similar mechanism on both sides of the intersection to induce bicyclists to slow speeds through this area. If warranted based on visitor conduct, the SFPUC shall place camera stations and enforcement personnel in this area to monitor for non-compliance, trespassing, and illegal collection.

Mitigation Measure M-BI-5c – Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians.

- The SFPUC shall reduce the likelihood of user-wildlife encounters and mitigate for permanent impacts on upland dispersal habitat for San Francisco garter snake and California red-legged frog in the Five Points area by preparing and implementing a five-year reptile and amphibian adaptive management plan.
- The plan shall be prepared by a qualified biologist (i.e., with a four-year degree and one to two years of field experience with the affected species) and reviewed by SFPUC senior biologists. The plan shall also address mechanisms for protecting California red-legged frog and San Francisco garter snake populations. Such mechanisms may include additional fencing, signage, increased enforcement, rerouting the road or trail, seasonal trail closure or return to docent-led access, or a monitoring program to preclude unauthorized off-trail use and other unauthorized activities.
- Such a monitoring program could include placing appropriate enforcement personnel at either end of the trail and at two- to three-mile intervals, and trail use could be conditional upon agreement to check in with monitors at reasonable intervals, which might vary depending on skill level and travel mode (i.e., hikers, bicyclists, or equestrians). Monitors would be connected (by phone or walkie-talkie) and identification would be required when users checked in.
- The adaptive management plan shall include mitigation for habitat loss at a 1:1 ratio within the watershed in the form of habitat enhancement or restoration. The SFPUC shall file the finalized plan with the San Francisco Planning Department prior to project construction.

San Francisco Garter Snake, Southern Skyline Ridge Trail

Proposed Access Program and Access Program Variants 2 and 3

Under the proposed access program and variants 2 and 3, the number of unsupervised visitors to the southern skyline ridge trail could be as high as 50,000 under variant 2. This number would likely be lower under the proposed access program and variant 3 due to the permit requirement under these access programs. The likelihood of visitors encountering the San Francisco garter snake is lower along the southern skyline ridge trail portion of the project area than for the Fifield-Cahill ridge trail because of that trail segment's distance from known habitat areas for this species. Nevertheless, because the potential for species occurrence on the southern skyline trail alignment cannot be discounted, and with the addition of substantial numbers of unsupervised pedestrians, bicyclists, and equestrians, the potential for adverse effects on San Francisco garter snake, including garter snake habitat, would be substantial.

As discussed above for San Francisco garter snake impacts on the Fifield-Cahill ridge trail under variant 3, the educational component of the permit program would increase visitors' awareness of San Francisco garter snake and its habitat, and visitors might therefore be less likely to engage in activities that could cause harm to the species relative to variant 2. In addition, with comparatively fewer visitors under variant 3 and anticipated greater adherence to watershed rules, overall impacts on San Francisco garter snake would be incrementally less than under variant 2.

Nevertheless, for the reasons noted above regarding the potential for species occurrence and possible user conflicts under an unsupervised access program—particularly those involving bicyclists and equestrians—the impact would be significant. Implementation of Mitigation Measures M-BI-5a, Protection of Special-Status Wildlife during Operations, and M-BI-5b, Additional Biological Protections for Unsupervised Access, would reduce this impact to a less-than-significant level by requiring limits on the hours of operation, speed limits for visitor vehicles, informational signage, and increased enforcement. The impact would not be significant and unavoidable as it would be for the Fifield-Cahill ridge trail, because the likelihood of visitors encountering San Francisco garter snakes on this portion of the trail is low due to the distance from known habitat areas for this species.

Mitigation Measures M-BI-5a and M-BI-5b apply to operation of the proposed access program and variants 2 and 3 along the southern skyline ridge trail.

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

(See page 4.8-92 for a description of the mitigation measure.)

Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.

(See page 4.8-93 for a description of the mitigation measure.)

Variant 1

The potential for occurrence of San Francisco garter snake is low in the southern skyline ridge trail portion of the project area, which is 1 mile from currently known locations of San Francisco garter snake and from suitable aquatic breeding habitat. In addition, because the trail alignment is adjacent to S.R. 35 on a ridgeline with no adjacent aquatic habitat, San Francisco garter snakes are unlikely to use the area as dispersal habitat. However, as described in Impact BI-2, with the proximity of suitable habitat at Lower Crystal Springs Reservoir, the potential for occurrence on the southern skyline trail alignment cannot be entirely discounted.

Operations under variant 1 would include increased docent-led visitation and maintenance of project components. As described for the Fifield-Cahill ridge trail, based on the absence of documented San Francisco garter snake injuries by the SFPUC during the past 14 years of docent-led public access and annual mowing for fuelbreaks, docent-led trail access and associated maintenance activities involving vehicles and equipment poses a minimal risk of snake injury or mortality on the southern skyline ridge trail. Thus, under variant 1, impacts on San Francisco garter snake on the southern skyline ridge trail would be less than significant.

Mitigation: None required.

California Red-Legged Frog, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Operations under the proposed access program and variant 1 would include docent-led visitation and watershed operations and maintenance, which could result in fatalities, injuries, or

disturbance to essential behaviors of California red-legged frog in upland areas that provide habitat for this species. Vehicles, equipment, or maintenance workers could crush individuals concealed in vegetation or cause harassment from noise or vibration, particularly in close proximity to aquatic breeding sites and nearby upland *aestivation* (summer dormancy) habitat such as between Pilarcitos Reservoir and Mud Dam pond, or between Lower Crystal Springs Reservoir and Pilarcitos Creek. This species has broad distribution in the Peninsula Watershed, occurring within 0.5 mile of the Fifield-Cahill ridge trail on portions of Pilarcitos Creek, and at Lower Crystal Springs Reservoir and Skyline Quarry. As previously noted, this species regularly disperses 0.5 mile or more from aquatic sites and may disperse 1 mile or farther to seek summer habitat, particularly if water is not available. Hence, while this species could be encountered on any portion of the Fifield-Cahill ridge trail, it is most likely to be encountered near aquatic sites such as near Pilarcitos Reservoir or Mud Dam (i.e., in the Five Points area), particularly during the rainy season.

While guided public use or routine maintenance activities involving vehicles and equipment could injure or kill California red-legged frogs, the SFPUC has not recorded any take of this frog during the past 14 years of docent-led public access along the Fifield-Cahill ridge trail. Thus, under the proposed access program and variant 1, impacts on California red-legged frog on the Fifield-Cahill ridge trail would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Project operations under access program variants 2 and 3 would include the same types of facility maintenance activities described for the proposed access program and variant 1, with increased visitation and a related increase in watershed facility maintenance, monitoring, and patrols.

The management plan EIR notes the possibility for losses of California red-legged frogs as a result of maintenance vehicles and trail use, which would be similar to the negligible staff impacts on California red-legged frog under the current docent-led program.[168] Maintenance actions, monitoring, and security patrols under both variants 2 and 3 would be similar, although more frequent than those described under proposed access program and variant 1, and would not result in significant impacts on California red-legged frog.

The potential for impacts on California red-legged frog from visitor use under variants 2 and 3 is expected to increase over baseline conditions due to increased visitation and increases in the limited existing use of the mowed trail shoulder and adjacent areas within newly installed fencing. Under variants 2 and 3, unsupervised visitation would increase the potential for direct impacts (e.g., trampling and crushing) on California red-legged frog and indirect impacts (i.e., damage to vegetation that provides upland or dispersal habitat). As discussed for operational impacts on rare plants, the SFPUC's survey of recreational land managers showed that, overall, agencies have curbed significant adverse impacts stemming from improper uses through educational signage, fencing and physical barriers, regular maintenance, and daily patrols and

[168] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.E, Natural Resources (p. V-27).

enforcement. The SFPUC would implement many of these actions to maintain the integrity of conditions within the Peninsula Watershed. These project features are described in Chapter 2, Project Description, and include lockable gates (Section 2.5, Project Components), trained volunteers (Section 2.7.1, Trail Access Management Program and Visitation), and patrols (Section 2.7.2, Trail and Facilities Operations and Maintenance), and their implementation would reduce potential impacts on California red-legged frog.[169]

Under variant 3, the educational component of the permit program would reduce the likelihood that visitors would encounter California red-legged frogs and cause harm to this species relative to variant 2. In addition, with comparatively fewer visitors under variant 3 and anticipated greater adherence to watershed rules, overall impacts on this species would be incrementally less than under variant 2. However, the potential remains for Fifield-Cahill ridge trail visitor activities—particularly those of bicyclists and equestrians—to inadvertently harm California red-legged frogs under variants 2 and 3. Because California red-legged frog is a federally listed species and primary prey species for San Francisco garter snake, the above-described effects on red-legged frogs under variants 2 and 3 would be significant.

Implementation of Mitigation Measures M-BI-5a, Protection of Special-Status Wildlife during Operations; M-BI-5b, Additional Biological Protections for Unsupervised Access; and M-BI-5c, Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians, would reduce this impact by requiring limits on the hours of operation, speed limits for visitor vehicles, informational signage, increased enforcement, and mitigation for disturbance to upland dispersal habitat. As described in Chapter 2, Project Description, Section 2.5, Project Components, and Section 2.7, Project Operations and Maintenance, the SFPUC would lock trail entries to prevent unauthorized afterhours access that could put users in conflict with California red-legged frog and would employ trained volunteers and patrols, thus further reducing the magnitude of this potential impact. However, in the absence of supervision from trained docents, some visitors might not comply with speed limits and other instructional signage intended to prevent mortalities of listed species; thus, unsupervised public use could result in the take California red-legged frog. Therefore, under variants 2 and 3, this impact would remain significant and unavoidable with mitigation.

Mitigation Measures M-BI-5a, M-BI-5b, and M-BI-5c apply to operation of access program variants 2 and 3 along the Fifield-Cahill ridge trail.

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

(See page 4.8-92 for a description of the mitigation measure.)

Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.

(See page 4.8-93 for a description of the mitigation measure.)

[169] ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.

Mitigation Measure M-BI-5c – Mitigation for Permanent Upland Impacts on Special-Status Reptiles and Amphibians.

(See page 4.8-95 for a description of the mitigation measure.)

California Red-Legged Frog, Southern Skyline Ridge Trail

Proposed Access Program and Access Program Variants 2 and 3

Under the proposed access program and variants 2 and 3, the number of unsupervised visitors to the southern skyline ridge trail could be as high as 50,000 under variant 2, and somewhat lower under the proposed access program and variant 3 due to the permit requirement. The addition of substantial numbers of unsupervised pedestrians, bicyclists, and equestrian users would increase the likelihood that trail users would accidentally harm California red-legged frog and its habitat. Such harm by visitors would include damaged vegetation within the fenced trail corridor or direct harm to frogs.

As discussed for California red-legged frog impacts on the Fifield-Cahill ridge trail under variant 3, the educational component of the permit program would advise visitors of the potential for harm to the species and its habitat. Thus, potential impacts on California red-legged frog would be less for the proposed access program and variant 3 than under variant 2. In addition, with comparatively fewer visitors under the permit program and anticipated greater adherence to watershed rules, overall impacts on California red-legged frog would be incrementally less under the proposed access program and variant 3 than for variant 2.

Nevertheless, the potential remains for visitor activities—particularly those of bicyclists and equestrians—to inadvertently harm this species under both variants 2 and 3. As this species is moderately likely to be present on the southern skyline ridge trail, and for the reasons noted previously regarding the rarity and sensitivity of the species, these effects would be significant under the proposed access program and variants 2 and 3.

Implementation of Mitigation Measures M-BI-5a, Protection of Special-Status Wildlife during Operations, and M-BI-5b, Additional Biological Protections for Unsupervised Access, would reduce this impact to a less-than-significant level by requiring limits on the hours of operation, speed limits for visitor vehicles, informational signage, and enforcement. As described in Chapter 2, Project Description, Section 2.5, Project Components, and Section 2.7, Project Operations and Maintenance, the SFPUC would patrol trail areas and lock trail entries to prevent unauthorized afterhours access that could put users in conflict with California red-legged frogs, which would further reduce the magnitude of this potential impact. Although frogs are moderately likely to be present in the southern skyline area, this trail is farther from aquatic habitat than the Fifield-Cahill ridge trail. In addition, visitors are unlikely to encounter frogs because most people would visit at midday, whereas frogs are more active at night, dawn, and dusk.

Mitigation Measures M-BI-5a and M-BI-5b apply to operation of the southern skyline ridge trail under the proposed access program and access variants 2 and 3.

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

(See page 4.8-92 for a description of the mitigation measure.)

Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.

(See page 4.8-93 for a description of the mitigation measure.)

Variant 1

The potential is lower for California red-legged frogs to be present in the southern skyline ridge trail portion of the project area, which is 0.5 mile from aquatic sites, than along the Fifield-Cahill ridge trail. Based on the relatively close proximity of frog populations at Lower Crystal Springs Reservoir and the considerable dispersal abilities of California red-legged frog, the species is moderately likely to occur on the southern skyline trail alignment. However, visitors are unlikely to encounter frogs because the trail is far from their preferred aquatic sites and frogs are less active at midday, although any frogs present in the area could experience similar impacts as those described for the Fifield-Cahill ridge trail.

Operations under variant 1 would include docent-led visitation and watershed operations and maintenance. As described for the Fifield-Cahill ridge trail, based on the lack of SFPUC-identified injuries of California red-legged frogs during the past 14 years of docent-led public access along the trail,[170] there is a minimal risk of frog injury or mortality on the southern skyline ridge trail during routine guided use or maintenance activities involving vehicles and equipment. Thus, under variant 1, impacts on California red-legged frog on the southern skyline ridge trail would be less than significant.

Mitigation: None required.

Marbled Murrelet, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Operations under the proposed access program and variant 1 would include ongoing watershed operations and maintenance and docent-led visitation. These activities would involve continued and potentially increased equipment and vehicle noise. Increased visitation would increase potential for visitor-generated food waste to attract or otherwise increase corvid populations in the watershed, increasing the likelihood of murrelet nest depredation.

While watershed maintenance activities that involve vehicles and equipment could generate noise, such maintenance would be similar to the infrequent maintenance actions performed under existing conditions. SFPUC operations staff would continue to limit maintenance traffic

[170] Lukins, Jeremy G., SFPUC, e-mail correspondence with Ellen Natesan, SFPUC, re: California Red-Legged Frog, May 16, 2019.

and mowing within suitable marbled murrelet nesting habitat, in accordance with U.S. Fish and Wildlife Service guidance (e.g., limiting noise disturbance within 0.25 mile from suitable habitat during nesting season) (see Impact BI-2 and Section 2.7.2, Trail and Facilities Operations and Maintenance). Moreover, as noted for Impact BI-2, the project components proposed for the proposed access program and variant 1 would be more than 0.5 mile from suitable nest habitat. Therefore, as no operations or maintenance actions are proposed within 0.25 mile of suitable habitat, there would be no impacts on marbled murrelets related to maintenance noise or disturbance.

As described in Impact BI-2, the growth of corvid populations is a primary contributor to the decline of marbled murrelets due to nest predation. Because corvids thrive on human litter and food waste, managing these food sources is critical to controlling corvid populations and protecting the small population of nesting murrelets in the watershed. Under access program variant 1, docents would accompany visitors and could exercise control over visitor behavior. Under the existing docent-led program, litter is rare on trails and has not been identified as a source of increased corvid populations. Under variant 1, the docent-led program is expected to result in rare incidences of food waste, similar to existing conditions, and is not expected to increase food sources to a degree that would alter the corvid population. In addition, the availability of secured garbage containers along the trail within restroom facilities (see Chapter 2, Project Description, Section 2.5.1.2, *Fifield-Cahill Ridge Trail Improvements*) would allow for the proper disposal of trash items and minimize the potential for attracting corvids. Hence, operations of the Fifield-Cahill ridge trail under the proposed access program and variant 1 would have a less-than-significant impact on marbled murrelet populations related to a potential increase in nest predators.

Mitigation: None required.

Access Program Variants 2 and 3

Operations under variants 2 and 3 would include ongoing watershed operations and maintenance, but visitation would be unsupervised. As described for the proposed access program and variant 1, equipment and vehicle noise during operation and maintenance activities could disturb nesting marbled murrelets, and visitor-generated food waste could attract or otherwise increase corvid populations in the watershed, increasing the likelihood of murrelet nest depredation.

As described for the proposed access program and variant 1, the SFPUC would continue to observe U.S. Fish and Wildlife Service guidance for operations and maintenance activities within 0.25 mile of suitable nest habitat; therefore, no impacts related to maintenance noise or disturbance of nesting marbled murrelets are anticipated.

Under variant 2 or 3, visitation would increase, resulting in a commensurate increase in watershed facility maintenance, monitoring, and patrols. Visitor-generated noise and other disturbance could also increase on the Fifield-Cahill ridge trail. Suitable nesting habitat for murrelets is present along the Cahill Ridge and overlaps the trail. However, recreational noise would generally be low in volume (e.g., loud talking), comparable to ambient noise levels and,

therefore, unlikely to exceed the noise thresholds contained within the U.S. Fish and Wildlife Service guidelines described more fully in Impact BI-2.

Based on informal surveys conducted by planning department personnel, the existing trails throughout the project vicinity—including Sweeney Ridge, Purisima Redwoods, Huddart Park, Montara Mountain, San Pedro Park, Phleger Estate, San Bruno Mountain, and Wunderlich Park—are essentially free of litter. Although these heavily used trails are open to public use without docents, permits, or other restrictions, litter is rarely encountered.[171] Thus, unsupervised visitors under variant 2 or 3 would not be expected to dispose of food scraps or other litter along the trail, rather than in the proposed trash containers, in quantities that could attract corvids at a level above baseline conditions. Additionally, the educational component of the permit program under variant 3 would further decrease the potential for visitors to leave food waste along the trail compared with variant 2, because it would train visitors in the importance of maintaining the trail free of food waste. Nevertheless, given the rarity and susceptibility of marbled murrelets to disturbance, this EIR conservatively concludes that unsupervised access under variants 2 and 3 along Fifield-Cahill ridge trail could indirectly increase nest predation, a significant impact. Implementation of Mitigation Measures M-BI-4, Operational Measures to Protect Sensitive Plant Species, M-BI-5a, Protection of Special-Status Wildlife during Operations; and M-BI-5b, Additional Biological Protections for Unsupervised Access, would reduce this impact to a less-than-significant level by requiring daily sweeps for litter, daily cleanup of any litter at trailheads, instructional signage, and enforcement.

> *Mitigation MeasuresM-BI-4, M-BI-5a, and M-BI-5b apply to operation of the Fifield-Cahill ridge trail under access program variants 2 and 3.*
>
> **Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.**
>
> (See page 4.8-88 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.**
>
> (See page 4.8-92 for a description of the mitigation measure.)
>
> **Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.**
>
> (See page 4.8-93 for a description of the mitigation measure.)

Marbled Murrelet, Southern Skyline Ridge Trail

Proposed Access Program and Variants

The southern skyline ridge trail is outside of suitable marbled murrelet critical habitat, and suitable murrelet nesting areas are more than 2 miles from the trail, across S.R. 92, and 1.4 miles from the trail, east of SR-35 and south of the Filoli estate. As described for construction of the

[171] Kern, Chris, Principal Planner, San Francisco Planning Department, Environmental Planning Division, Memorandum to Elijah Davidian, Senior Managing Associate at Environmental Science Associates, March 18, 2020.

southern skyline ridge trail (see Impact BI-2), trail operations and maintenance are not expected to cause direct or indirect impacts on nesting murrelets due to the distance between the trail and suitable murrelet habitat. Also, major changes in the corvid population are not expected based on the distance between nesting areas and other potential sources of roadkill and food waste (e.g., I-280 and the Ox Mountain Sanitary Landfill, within 2 miles), coupled with the availability of wildlife-proof trash containers along the trail in restroom facilities, as described in Chapter 2, Project Description, Section 2.5, Project Components. Hence, while populations of corvid species could increase through the increased availability of food waste, there would be no impact on nesting murrelets. Therefore, implementation of the proposed access program and variants along the southern skyline ridge trail would have no impact on marbled murrelets.

Mitigation: None required.

Special-Status Butterflies, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

The management plan EIR recommends monitoring for listed butterflies and food plants in Program-Level Mitigation Measure E.3. The intent of the monitoring program is to determine when to temporarily fence stands of food plants or exclude trail users from portions of the trail.[172] Since publication of the management plan EIR, annual surveys of San Bruno elfin butterfly and Mission blue butterfly have taken place in the watershed. Monitoring for host plants and butterfly populations have not shown an impact from docent-led public trail use during the 14-year monitoring period.[173]

Operations under the proposed access program and variant 1 would include ongoing watershed operations and maintenance and docent-led visitation. The SFPUC currently flags butterfly host plants along the Fifield-Cahill ridge trail identified during the annual surveys and would continue to do so under the proposed access program and variant 1. Operation and maintenance vehicles currently avoid flagged areas of host plants, and thus no impacts occur under baseline operational conditions. Under the proposed access program and variant 1, trained docents would guide visitors around sensitive plants. Therefore, impacts would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Under variants 2 and 3, Fifield-Cahill ridge trail visitation is expected to increase substantially and would be unsupervised (i.e., without docent supervision). As noted previously, lupine species—the host plants for Mission blue butterflies—tend to grow along trail edges, even between tire tracks on the Fifield-Cahill ridge trail. Unsupervised visitation would increase the potential for direct impacts (e.g., trampling and crushing) from pedestrian, bicycle, and equestrian traffic. Such disturbance could result in the take of listed butterflies, including destruction of larvae and the permanent loss of occupied habitat for Mission blue butterfly or

[172] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.E, Natural Resources (p. VI-3).

[173] Arnold, Richard A., *Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, December 2016.

San Bruno elfin butterfly and the spread of pathogens to host plants, a significant impact. Implementation of Mitigation Measures M-BI-2b, Avoidance and Mitigation for Host Plants of Listed Butterfly Species; M-BI-5a, Protection of Special-Status Wildlife during Operations; and M-BI-5b, Additional Biological Protections for Unsupervised Access, would reduce this impact by requiring educational and instructional signage and enforcement of use rules.

Lupine species cannot be fenced because some plants grow in the middle of roads used by maintenance vehicles. Under variant 3, due to the educational training required to obtain a permit, watershed visitors would likely be more aware of the importance of avoiding impacts on butterfly host plants, sensitive vegetation, and special-status species. However, without trained docents, it cannot be concluded with certainty that all visitors would comply with instructions intended to avoid trampling or other adverse effects on host plants, which could result in the take of special-status butterfly species. Thus, under variants 2 and 3, this impact remains significant and unavoidable with mitigation. Mitigation Measure M-BI-5b includes restoration of host plants and/or payment of an in-lieu fee to promote the restoration of habitat for special-status butterflies.

Mitigation Measures M-BI-2b, M-BI-5a, and M-BI-5b apply to operation of the Fifield-Cahill ridge trail under access program variants 2 and 3.

Mitigation Measure M-BI-2b – Avoidance and Mitigation for Host Plants of Listed Butterfly Species.

(See page 4.8-71 for a description of the mitigation measure.)

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

(See page 4.8-92 for a description of the mitigation measure.)

Mitigation Measure M-BI-5b – Additional Biological Protections for Unsupervised Access.

(See page 4.8-93 for a description of the mitigation measure.)

Special-Status Butterflies, Southern Skyline Ridge Trail

Proposed Access Program and Variants

The portion of the project area south of S.R. 92 lacks habitat for listed butterfly species; thus, operation of the southern skyline ridge trail in this area would have no impact on these species.

Mitigation: None required.

San Francisco Dusky-Footed Woodrat and American Badger, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Woodrats are abundant in the project area but typically construct nests in inconspicuous locations under trees or shrubs and not in the midst of trails. Accordingly, nests in woodland or shrub areas fringing trails would likely be constructed outside of the visitor travel paths, and

therefore would not likely be disturbed or crushed by trail users. Furthermore, under the proposed access program and variant 1, docents would be present to assist visitors in avoiding impacts on woodrats. Because American badger dens are typically constructed in open grassland and not within trails, maintenance staff and visitors are not likely to encounter this species. Thus, impacts on these species would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Under access program variants 2 and 3, a greater number of visitors (up to a fifty-fold increase under variant 2) would use Fifield-Cahill ridge trail. Operation and maintenance activities would also increase accordingly. The operational activity would, correspondingly, increase the likelihood of disturbance or damage to woodrat nests adjoining the trail. However, even with larger crowds of visitors and increased maintenance traffic, visitors and vehicles would be unlikely to enter wooded areas that support woodrat nests or accidentally disturb the substantial nests that may be located in or under shrubs and trees along the trail. American badgers would not construct dens within trails, for reasons explained above. Furthermore, with the fencing and other measures (e.g., signage and education) proposed to discourage off-trail use, maintenance staff and visitors are not likely to encounter this species. Thus, impacts on these species would be less than significant.

Mitigation: None required.

San Francisco Dusky-Footed Woodrat and American Badger, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Impacts on San Francisco dusky-footed woodrats and American badgers along the southern skyline ridge trail would be the same as described for operational impacts on the Fifield-Cahill ridge trail. For the reasons presented above, the impact would be less than significant.

Mitigation: None required.

Nesting Birds and Roosting Bats, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Under the proposed access program and access variant 1 along the Fifield-Cahill ridge trail, any maintenance activities that involve extensive vegetation management or removal could result in direct impacts on breeding birds through mortality or disruption of active breeding. Docent-led public access under the proposed access program and variant 1 would have a less-than-significant impact on nesting birds or active bird nests. No impacts on roosting bats are expected during normal watershed operations and maintenance or from the presence of visitors and related recreational use.

Removal of trees, tall grasses, and/or shrubs for fuelbreak maintenance or other vegetation management purposes could disturb or harm nesting birds or roosting bats in these areas. Therefore, implementation of the proposed access program and variant 1 along the Fifield-Cahill ridge trail could result in substantial adverse effects on nesting birds, which would be a

significant impact. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts, would reduce this impact to a less-than-significant level by requiring vegetation removal outside of the bird nesting season when possible, and, when not possible, by requiring surveys to establish the absence of nesting birds prior to significant vegetation removal that could harm birds, and by ensuring maternity roosts are avoided and bats are evacuated from nightly roost trees before vegetation removal.

Mitigation Measures M-BI-2d and M-BI-2e apply to operation of the Fifield-Cahill ridge trail under the proposed access program and access program variant 1.

Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.

(See page 4.8-74 for a description of the mitigation measure.)

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

(See page 4.8-75 for a description of the mitigation measure.)

Access Program Variants 2 and 3

Under variant 2 and 3, operation and maintenance traffic would increase to serve the greater numbers of visitors who would use Fifield-Cahill ridge trail. The increased activity could slightly increase the likelihood of disturbance to active bird nests near the trail; however, as discussed for the proposed access program and variant 1, the impacts on nesting birds from recreational use would be less than significant.

As described for the docent-led access programs, above, the removal of trees, tall grasses, and/or shrubs for fuelbreak maintenance or other vegetation management purposes could disturb or harm nesting birds or roosting bats near the trail. Therefore, implementation of variants 2 and 3 along the Fifield-Cahill ridge trail could result in substantial adverse effects on nesting birds, which would be a significant impact. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts**,** would reduce this impact to a less-than-significant level by requiring vegetation removal outside of the nesting season when possible and, when not possible, by requiring surveys to establish the absence of nesting birds prior to significant vegetation removal that could harm birds.

Mitigation Measures M-BI-2d and M-BI-2e apply to operation of the Fifield-Cahill ridge trail under access variants 2 and 3.

Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.

(See page 4.8-74 for a description of the mitigation measure.)

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

(See page 4.8-75 for a description of the mitigation measure.)

Nesting Birds and Roosting Bats, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Impacts on nesting birds and roosting bats on the southern skyline ridge trail would be the same as described for the Fifield-Cahill ridge trail. Operations and maintenance activities along the southern skyline ridge trail under the proposed access program and variants, especially vegetation management, could harm or disturb nesting birds, which is a significant impact. Implementation of Mitigation Measures M-BI-2d, Measures to Minimize Disturbance to Nesting Bird Species, and M-BI-2e, Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts**,** would reduce this impact to a less-than-significant level by requiring vegetation removal outside of the nesting season when possible, and, when not possible, by requiring surveys to establish the absence of nesting birds prior to significant vegetation removal that could harm birds.

Mitigation Measures M-BI-2d and M-BI-2e apply to operation of the southern skyline ridge trail under the proposed access program and variants.

Mitigation Measure M-BI-2d – Measures to Minimize Disturbance to Nesting Bird Species.

(See page 4.8-74 for a description of the mitigation measure.)

Mitigation Measure M-BI-2e – Avoidance and Mitigation Measures for Special-Status Bats and Maternity Roosts.

(See page 4.8-75 for a description of the mitigation measure.)

Wildlife Corridors, Fifield-Cahill Ridge Trail

Proposed Access Program and Access Program Variant 1

Because of its openness and minimal human development that could impede wildlife movement, Fifield-Cahill ridge trail may serve as an active dispersal corridor for wildlife. Species that may use the Fifield-Cahill ridge trail to move in a north-south direction, or east-west from Crystal Springs Reservoir and Mud Dam to Pilarcitos and Stone Dam, include California red-legged frog, San Francisco garter snake, and numerous common small mammal, amphibian, and reptile species. Large mammal species, including mule deer, mountain lion, bobcat, and gray fox, also likely use the Fifield-Cahill ridge trail. Human or vehicle traffic can injure or kill wildlife and cause species to avoid traversing Fifield and Cahill ridges when people are present. As noted previously, under the current docent program and associated ongoing watershed operations and maintenance activities, no substantial adverse effects on wildlife populations have been documented. Because the proposed access program and variant 1 would involve only a minor increase in visitation (from three days per week to four) and associated operations/maintenance

activities along the Fifield-Cahill ridge trail, impacts on wildlife corridors would be less than significant.

Mitigation: None required.

Access Program Variants 2 and 3

Under access program variant 2 and variant 3, the SFPUC would install new fencing along segments of the Fifield-Cahill ridge trail between Portola Gate and Cemetery Gate. This fencing would include un-barbed bottom wiring (with 12 to 18 inches of space underneath). Reptile and amphibian wildlife movement would be unimpeded, as these animals would be able to pass under the fence and across the trail. Mammals would be able to pass under or over the fence.

Trail use would not present a physical barrier to San Francisco garter snakes, California red-legged frogs, or other reptile, amphibian, or mammal species attempting to cross the road. The trail would be closed to visitors at night, when most *nocturnal* (active mainly at night) and *crepuscular* (active mainly at twilight) animals move; therefore, human presence and traffic on the trail is not expected to affect the movement of these animals. However, during daylight hours, when the trail is open to the public, visitor and maintenance traffic could pose an impediment to the movement of *diurnal* (active mainly during the day) wildlife species across or along the trail route. Diurnal animals—which are most active in the morning and evening hours—could encounter visitors or vehicles during trail visitation hours, resulting in reduced daytime use of trailside areas for some species (e.g., for animals such as deer, bobcat, and gray fox that tend to avoid humans). The increase in trail avoidance behavior by some wildlife species due to human traffic could produce a minor impediment to movement when humans are present. However, most diurnal species are active in the morning and evening hours, when trail use is expected to be low, and therefore such encounters would be minimal.

It is unknown how different wildlife species would respond to substantial increases in traffic along the Fifield-Cahill ridge trail. However, it is reasonable to assume that given the magnitude of the estimated visitation increases (up to fifty-fold) under variant 2 or 3, the use of roadside areas by California red-legged frog, San Francisco garter snake, and other wildlife species could change compared to existing conditions. Such changes in wildlife behavior, if they were to occur, could restrict the use of habitat and the timing of movements, thereby increasing habitat fragmentation and hazards and reducing the fitness of animals unable to access food or cover, which would be a significant impact.

Implementation of Mitigation Measure M-BI-5a, Protection of Special-Status Wildlife during Operations, would limit trail access to the hours of 9 a.m. to 4 p.m. in winter and 8 a.m. to 6 p.m. in summer, which would reduce the effect of trail operations on wildlife movement corridors, including the daily timing or seasonality of corridor use for wildlife species. With implementation of MI-BI-5a, access program variants 2 and 3 would result in a less-than-significant impact on wildlife movement corridors along the Fifield-Cahill ridge trail.

Mitigation Measure M-BI-5a applies to operation of the Fifield-Cahill ridge trail under access program variants 2 and 3.

Mitigation Measure M-BI-5a – Protection of Special-Status Wildlife during Operations.

(See page 4.8-92 for a description of the mitigation measure.)

Wildlife Corridors, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Due to the proximity of the proposed southern skyline ridge trail to S.R. 35—an existing hazard to wildlife movement from one side of the ridge to the other—the proposed trail would not create a substantial new barrier to wildlife movement in an east-west direction relative to existing conditions. However, mammals, reptiles, and amphibians may now freely move along this corridor in a north-south direction. The project would incorporate fencing with un-barbed bottom wire to allow for wildlife passage; although, increased trail and maintenance traffic might limit use by wildlife more than under baseline conditions. Project effects on wildlife could include the risk of injury or mortality from bicycle, equestrian, and pedestrian traffic, which could inhibit wildlife from using the trail, thus contributing to habitat fragmentation and potentially restricting the ability of wildlife to reach food, young, mates, or cover.

Because the adjacent S.R. 35 already reduces the utility of the southern skyline ridge trail area for east-west wildlife movement, the fragmentation and barrier effects of the proposed access program and variants are likely to be minimal, and variations in the severity of impacts among the access programs under consideration would likewise be negligible. The southern skyline ridge trail alignment is bound to the west by a busy road and to the east by steeply sloping topography; it does not serve as an important migration corridor. Therefore, operation of the southern skyline ridge trail would not substantially interfere with the movement of native resident or migratory wildlife species. Thus, the impacts would be less than significant for the proposed access program and variants.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project with the proposed access program along the Fifield-Cahill ridge trail could result in significant impacts on special-status wildlife. Implementation of Mitigation Measures M-BI-2d and M-BI-2e would reduce impacts on special-status wildlife to a less-than-significant level. In addition, project operation with the proposed access program along the southern skyline ridge trail could result in significant impacts on special-status wildlife. Implementation of Mitigation Measures M-BI-2d, M-BI-2e, M-BI-5a, and M-BI-5b would reduce impacts on special-status wildlife to a less-than-significant level. For the reasons presented, operation of the project with the proposed access program would have a less-than-significant impact on special-status wildlife with implementation of the recommended mitigation.

Impact BI-6: The project would not result in operational impacts on sensitive natural communities, including riparian habitat and wetlands. (Less than Significant)

The management plan EIR considers the potential effects of project operation on sensitive natural communities. The document concludes that potential effects of operation could be significant and recommends Program-Level Mitigation Measures E.1 and E.2 and Project-Level Mitigation Measures 1 through 3 to reduce those impacts.[174] The measures call for preconstruction site assessments, avoidance of sensitive habitat areas, development of a vegetation management plan, and resource monitoring. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of the potential impacts on sensitive natural communities, including wetlands and riparian areas, and of the efficacy of the previously identified mitigation. Accordingly, the management plan EIR mitigation measures have been updated and refined in this EIR based on consideration of this new information and changes to the status and distribution of sensitive natural communities.

Sensitive Natural Communities – Upland Vegetation, Fifield-Cahill Ridge Trail

As explained for Impacts BI-1 and BI-4, the Fifield-Cahill ridge trail is subject to various uses and activities under existing conditions, including mowing, fuel management, road maintenance, watershed operations vehicle traffic, and pedestrian, bicycle, and equestrian trail use. At the same time, under current conditions, the edges and center of the road are well vegetated and include intact examples of sensitive natural communities such as the serpentine grassland/annual flower fields on Fifield Ridge.

Proposed Access Program and Access Program Variant 1

Direct operational impacts on sensitive natural communities under the proposed access program and variant 1 would consist of minor loss of herbaceous and understory vegetation along the Fifield-Cahill ridge trail and edges of the loop trail. However, project construction would have already disturbed the trail edges, which do not presently contain intact examples of sensitive natural communities occurring in the project area. Although areas of perennial grassland (i.e., serpentine bunchgrass and needlegrass grassland) do occur in close proximity to the trail, under the proposed access program and variant 1, visitors would be in small groups and under docent supervision. For these reasons, impacts on vegetation caused by visitors trampling sensitive resources would be avoided or minimized.[175] As a result, implementation of the proposed access program and variant 1 would have a less-than-significant impact on sensitive natural communities.

Mitigation: None required.

[174] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-6 (p. III.E-32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI, Natural Resources (pp. VI-3 and VI-4).

[175] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-6 (p. III.E-32); Section V.E, Natural Resources (pp. V-26 through V-29); Section VI, Natural Resources (pp. VI-3 and VI-4).

Access Program Variants 2 and 3

As previously discussed, future visitation under these variants is estimated at up to 50,000 people under variant 2, and somewhat lower under variant 3. While most trail users would be expected to stay entirely on the developed trails, limiting operational impacts on sensitive natural communities. However, as noted previously, unsupervised use (i.e., variants 2 and 3) is likely to result in some degree of off-trail use,[176] and visitors could affect sensitive natural communities by trampling vegetation or creating informal trails in the vicinities of the Fifield-Cahill ridge trail. Under variant 3, visitors would undergo educational training that addresses the presence of watershed resources, such as sensitive natural communities. With relatively fewer visitors under variant 3, and anticipated greater adherence to watershed rules due to training, potential impacts on sensitive natural communities would be less than under variant 2.

For the loop trail, a narrow unvegetated trail edge could develop in limited areas under variants 2 and 3. The magnitude of the habitat disturbance would be minor (less than significant) given that the forest is primarily secondary growth and these edge areas do not represent undisturbed vegetation communities.

Increased visitor traffic could incrementally reduce the density of vegetation currently growing on the trail. Visitor impacts would be concentrated at specific locations—such as viewpoints and sensitive grasslands—that have scenic appeal. Serpentine bunchgrass and valley needlegrass natural communities are present at the trail edge, and trail use could result in a minor loss of such habitats due to trampling; however, the impact would be less than significant given the small area of potential disturbance compared with the relative abundance of these plant communities within the surrounding area. The proposed fencing would not protect against the loss of these resources because it would be set back from the trail by up to 50 feet.

Mitigation: None required.

Sensitive Natural Communities – Upland Vegetation, Southern Skyline Ridge Trail

Proposed Access Program and All Variants

The proposed southern skyline ridge trail would have a 6-foot-wide surfaced area, so few users would need to step off the trail to make way for passing—except perhaps for a mixed group that included equestrian users and bicyclists. Under the proposed access program and variant 1, users would be likely to remain on the trail and avoid damage to sensitive natural communities. However, for the southern skyline ridge trail, it is conservatively assumed that with an unsupervised access program (i.e., proposed variants 2 and 3), the number of visitors would increase, and a portion of the visitors would stray from established trails. Left unchecked, such off-trail use could result in localized trail widening or the formation of casual trails in concentrated areas (such as viewpoints) that support sensitive natural communities, such as perennial grasslands or redwood or tanoak forests.

In forested habitats such as coast redwood or tanoak forest off-trail usage would not directly affect the tree overstory, but the understory adjacent to the trail could remain unvegetated in

[176] ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.

areas of heavy traffic. In addition, the SFPUC might occasionally mow or trim vegetation in areas adjacent to the trail. These activities could have a minor impact on sensitive natural communities within the portion of the project area proposed for the southern skyline ridge trail and could diminish the development or complexity of sensitive natural communities in trodden or maintained areas through which the trail passes. However, as discussed for Impact BI-3 above, project construction would have already disturbed the vegetation on the trail and the trail edges. In addition, due to past clearing and disturbance, the trail area does not presently contain intact examples of sensitive redwood or tanoak forest.

Sensitive natural community impacts would be negligible under variant 1, because docents would supervise visitation and prevent visitors from venturing off the trail. The variant 1 impact would be less than significant. Under variant 2, off-trail use could result in localized trail widening or formation of casual trails in concentrated areas including sensitive natural communities. However, these impacts would be small relative to the extent of the affected community, and substantial effects would not result. Thus, the variant 2 impact would be less than significant. Further, under the proposed access program and variant 3, visitors would undergo educational training that addresses the presence of sensitive resources along trails. With relatively fewer visitors anticipated under the proposed access program and variant 3, coupled with greater adherence to watershed rules due to training, visitor impacts on sensitive natural communities would be reduced relative to variant 2. As a result, the proposed access program and variant 3 impacts would also be less than significant.

Based on the above considerations, project implementation along the southern skyline ridge trail would have a less-than-significant impact on sensitive natural communities under the proposed access program and all variants.

Mitigation: None required.

Sensitive Natural Communities – Wetlands and Riparian Areas, Fifield-Cahill Ridge Trail

Proposed Access Program and Variants

Operations under the proposed access program and all variants on the Fifield-Cahill ridge trail would not involve management, maintenance, or visitor use activities that could result in the removal, fill, or hydrologic interruption of wetlands, riparian areas, or seasonal drainages within the portion of the project area north of S.R. 92. Therefore, project operations would have no impact. Section 4.10, Hydrology and Water Quality, provides additional discussion of visitor use impacts on wetlands and seasonal drainages.

Mitigation: None required.

Sensitive Natural Communities – Wetlands and Riparian Areas, Southern Skyline Ridge Trail

Proposed Access Program and Variants

Under the proposed access program and variants on the southern skyline ridge trail, project management, maintenance, and visitor use activities would mainly be limited to upland areas

and would not entail the removal, fill, or hydrologic interruption of wetlands, riparian areas, or seasonal drainages within the portion of the project area south of S.R. 92. The SFPUC would avoid visitor use and operations impacts on seasonal wetlands along the trail alignment by routing the trail between wetlands, as described in Impact BI-3. As noted in that impact discussion, a small segment of fencing would traverse one wetland (Figure 2-3c). To the extent the fencing requires repair, the work would be conducted with hand tools and would not result in substantial adverse effects on the wetland habitat, as described in Chapter 2, Project Description, Section 2.6.5, Avoidance of Wetlands and Bridge Installation.

For the northernmost seasonal drainage along the trail (Figure 2-3b) SFPUC would install a prefabricated footbridge, the footings of which would be placed in upland areas beyond the extent of the drainage limits. Farther south, the southern skyline ridge trail alignment was designed to avoid bisecting the southernmost depression that receives seasonal drainage from a culvert beneath S.R. 35 (Figure 2-3d). The trail would be set back 5 feet from this drainage and visitors would be allowed to traverse the unimproved 2-foot-wide drainage. In this area, workers would install a sign on either side of the drainage instructing visitors to watch their step. Visitor traffic in this area is likely to result in damage to wetland vegetation and hydrologic interruption from foot, bicycle, and equestrian traffic. However, because the area is a small (approximately 2-foot-wide) isolated depression, it is non-jurisdictional, meaning it would not constitute a federally protected wetland as defined by Section 404 of the Clean Water Act. Moreover, the area of potential disturbance would be roughly 12 square feet, limited primarily foot and bicycle tire traffic, and on either side of which visitors would be advised through signage to avoid the drainage. Thus, with appropriate signage, overall operational impacts on wetlands would not result in a substantial adverse effect on a sensitive natural community. Therefore, impacts on wetland habitat resulting from management, maintenance, and visitor use of the southern skyline ridge trail would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project with the proposed access program along the Fifield-Cahill ridge trail and southern skyline ridge trail would result in less-than-significant impacts related to sensitive natural communities, and no mitigation is required.

Analysis of Construction and Operational Impacts Related to the Spread of Invasive Plant Species and Pathogens

Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens. (Significant and Unavoidable with Mitigation)

The management plan EIR considers construction and operations impacts related to the spread of invasive plant species. The document concludes potential effects could be significant and

recommends Program-Level Mitigation Measures E.1 and E.2 and Project-Level Mitigation Measures E.1 through E.3 to reduce those impacts.[177] The measures call for actions including preconstruction surveys, avoidance of sensitive habitat areas, development of a vegetation management plan, and resource monitoring. Since certification of the management plan EIR, the SFPUC has developed a more detailed project proposal that allows for a more detailed review of potential impacts related to the spread of invasive plants and of the efficacy of the previously identified mitigation. Accordingly, the management plan EIR mitigation measures have been updated in this EIR based on consideration of this new information.

The management plan EIR does not evaluate the potential for project construction or operation to spread pathogens. Therefore, this analysis does not rely upon or incorporate information from the management plan EIR on this topic.

Invasive Plants

Construction Impacts for Proposed Access Program and Variants

Invasive plants can spread through natural means such as wind, water, and animal transport of plant seeds. It is also likely that current maintenance and recreational activities in the watershed spread invasive plants seeds. During the proposed construction, the potential exists for project-related equipment, personnel, and vehicles to spread invasive weeds. Seeds could be transported via dirt, mud, or water carried on tires, equipment, footwear, supplies, gravel, or erosion control materials (e.g., straw wattles), or through the use of seed-laden fill. With project construction, an increase in traffic could expand the spread of invasive plant seeds between construction sites and along transportation routes, beyond levels expected under baseline conditions with normal watershed operations and maintenance. When construction sites are cleared, the bare ground creates ideal conditions for the establishment of invasive plants.

Once invasive plants are established, vigorously growing invasive species have the potential to permanently exclude native plants. In addition, densely grown dry weeds can alter fire regimes and increase the potential for fires to spread,[178] creating a risk for habitats beyond the project footprint. Many invasive plants are present in or near the watershed and could be spread as a result of construction activities.

Under the proposed access program and variants, construction activities could introduce certain invasive plants—such as yellow star thistle, stinkwort, and other species known to be present elsewhere on the San Francisco Peninsula—and these species could establish in sensitive natural communities, including coast redwood forest, tanoak forest, Douglas fir forest, serpentine bunchgrass, and needlegrass grassland in the project area. The potential for these effects would be similar for the proposed access program and variants. However, with the additional Fifield-

[177] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.E, Natural Resources, Table III.E-5 and III.E-6 (pp. III.E-28 and III.E-32); Section V.E, Natural Resources (pp. V-25 through V-29); Section VI, Natural Resources (pp. VI-3 and VI-4).

[178] California Invasive Plant Council, *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers* (3rd ed.), Cal-IPC Publication 2012-03, California Invasive Plant Council, Berkeley, CA, *www.cal-ipc.org*, accessed May 30, 2017.

Cahill ridge trail fencing proposed under variants 2 and 3, the extent of these effects within the project area could be greater under these access variants.

Because of the potential for invasive species to spread into and outcompete sensitive natural communities and rare plant populations in the vicinity of the project site, and because invasive weeds, once established, would be difficult to control with the herbicide and ground-disturbance activities permissible in sensitive habitat areas of the watershed, the impact is considered significant. Implementation of Mitigation Measure M-BI-7a, Measures to Reduce Spread of Invasive Plants, would reduce this impact to a less-than-significant level by requiring: construction equipment to be cleaned and free of invasive weed seeds before arriving at the project site; restrictions on the types of fill and erosion control materials allowed; and development and implementation of an invasive plant management plan that includes invasive plant surveys and removal.

Operational Impacts for Proposed Access Program and Variants

Wildlife and wind can spread invasive plants seeds, which may become established even in intact natural communities, and human activity can accelerate the transmission and establishment of these species. As discussed in Chapter 2, Project Description, Section 2.7.1, Trail Access Management Program and Visitation, visitation along the Fifield-Cahill ridge trail would increase under the proposed access program and variants, although the increase would be less under the proposed access program and variant 1 due to the docent requirement. Similarly, visitation along the southern skyline ridge trail would increase under the proposed access program and variants, although the increase would be less under variant 1 for the same reason. Nevertheless, any such increase in visitation would result in a commensurate increase in the potential spread of invasive plants by visitors. The spread of invasive plants in the course of project operations would have impacts on the same sensitive and special-status vegetation communities for similar reasons (e.g., ability to spread and outcompete, difficulty controlling, etc.) described above for project construction. Impacts would be greater along the Fifield-Cahill ridge trail under variants 2 and 3, and along the southern skyline ridge trail under the proposed access program and variants 2 and 3, because unsupervised visitors would be more likely to trample vegetation, allowing for the spread of weed propagules, and to carry propagules from outside the watershed. As a result, while the degree of effect could vary among the access programs, due to the project's increase in visitation and the associated increased risk of invasive species spread, operational impacts would be considered significant. As discussed for project construction, and for the same reasons, implementation of Mitigation Measure M-BI-7a, Measures to Reduce Spread of Invasive Plants, would reduce this impact to a less-than-significant level.

Mitigation Measure M-BI-7a applies to operation of all project components.

Mitigation Measure M-BI-7a – Measures to Reduce Spread of Invasive Plants.

The SFPUC shall ensure the following measures to reduce spread of invasive plants are implemented:

- Construction equipment shall arrive at the project area free of soil, seed, and plant parts to reduce the likelihood of introducing new weed species

- Any imported fill material, soil amendments, gravel, etc., required for construction and/or restoration activities that would be placed within the upper 12 inches of the ground surface, shall be certified free of weed seeds and plant material. (see: www://cal-ipc.org/ip/prevention/WeedFreeLandManagers_web.pdf)
- Certified, weed-free, imported erosion-control materials (or rice straw in upland areas) shall be used exclusively, as applicable (this measure concerns biological material and does not preclude the use of silt fences, etc.).
- Excavated topsoil shall be salvaged, stored on-site, and reused on the site if it is of suitable quality, or removed and disposed at an appropriate offsite location if it is not suitable.
- Prepare and implement an invasive plant management plan for the Fifield-Cahill ridge trail and southern skyline ridge trail segments on Peninsula Watershed lands. At a minimum, the plan shall commit the SFPUC to carry out semiannual surveys and treatment and removal of target invasive plants on the southern skyline ridge trail and Fifield-Cahill ridge trail segments during the operation of the ridge trail. The plan shall specify invasive exotic plant species shall be managed using integrated pest management practices, and define invasive plants as those which the Cal-IPC rates as high in invasiveness, and a subset of those it rates as moderate in invasiveness and which pose relevant management concerns for the ridge trail region of the Peninsula Watershed (i.e., could spread along the trail). The plan shall except from this definition any species that are already widespread and naturalized in the watershed (e.g., annual and perennial non-native grasses, rough cat's ear, etc.). The performance standard for target invasive weeds shall be no more than 5 percent absolute cover, or no more than 30 percent above-baseline invasive plant cover, whichever is higher, within 20 feet of the southern skyline ridge trail, Fifield-Cahill ridge trail, or Quarry Road edge.

Pathogens

Construction Impacts

Proposed Access Program and Variants

As described in Section 4.8.2.5, *Invasive Species*, *Phytophthora* pathogens including sudden oak death are present in the watershed and in the project area. As also noted in that section, these pathogens can be spread naturally through strong winds, rain, infected soil and plant matter (such as from nursery stock) and by animals. Air transmission is the prevalent mode of spread for sudden oak death (*P. ramorum*), while soil movement is the more prevalent mode for other *Phytophthora* species known to occur in the watershed (e.g., *P. cinnamomi, P. cambivora, P. cactorum, P. cryptogea, P. megasperma, P. chlamydospora,* and *P. gonapodyides*). Human activities can accelerate the transport of pathogens, including the movement of infected dirt, mud, and water carried on tires, equipment, footwear, and supplies during construction. Sudden oak death and other plant pathogens have been documented throughout the watershed, including within portions of the project area north and south of S.R. 92.[179,180] It is recognized that *Phytophthora* is progressively spreading in California forest lands, and that both the magnitude of the infestation

[179] AECOM, *Draft Natural Environment Study*, July 2017.
[180] Garbelotto, Matteo and Laura Sims, *Progress Report on Distribution of Phytophthora ramorum, Sudden Oak Death, Across the SFPUC Holdings in San Mateo County*, unpublished report prepared for SFPUC, January 2017, 18 pp.

and speed with which it is growing in the watershed may increase with or without the project. With such a dynamic baseline, it is not possible to distinguish a project-caused increase in *Phytophthora* infestation from the natural spread.

If project construction activities were to move infested vegetation or soil, a pathogen may be moved as well, potentially spreading the pathogen to otherwise healthy vegetation communities elsewhere in the watershed. The spread of *Phytophthora* pathogen species could be faster under the project than under baseline conditions, because project construction activities would result in more traffic and soil disturbance, particularly if soil-disturbing activities were to occur during the rainy season when these pathogens spread most readily and spores survive longer.

Sensitive natural communities (e.g., old growth Douglas fir, redwood, and tanoak forest) could be affected by the spread of sudden oak death and other pathogens faster than under baseline conditions. This is because many of the principal associates of these forests in the watershed—huckleberry, madrone, tanoak, coffeeberry, California bay, and others—are vulnerable to invasive *Phytophthora* pathogen species known to be present but somewhat limited in distribution within the watershed. Lupine species that host the endangered Mission blue butterfly are also susceptible to infection by *Phytophthora* pathogens. The potential for these effects would be similar for the proposed access program and all access program variants. However, variants 2 and 3 would include construction of Fifield-Cahill ridge trail fencing. As a result of increased construction activity on Fifield and Cahill ridges, and vegetation trimming where necessary for fence installation, these effects could be greater under access variants 2 and 3.

As discussed, the degree of accelerated spread that could occur with project construction remains unknown. However, because of the devastating effects these pathogens can have on vegetation communities that support special-status plants within the watershed, and because once established they are extremely difficult to control, the potential for project construction activities to spread plant pathogen infection to other areas is considered a significant impact. To reduce the potential for these impacts, and as described in Section 2.6.11, *Plant Pathogen Prevention*, of Chapter 2, Project Description, the SFPUC would include in its construction contract specifications measures to control the spread of pathogens that the contractor would be required to implement. Appendix D presents these measures, which include worker training; cleaning and sanitation of vehicles, equipment, footwear, and tools prior to entering and leaving work sites; minimizing the movement of soil and plant material within work sites; and restrictions on the import of construction materials, including soil and plant materials. Through adherence to these measures, which would be mandatory, the impact would be reduced to a less-than-significant level for the proposed access program and variants because the proposed measures would minimize the possibility of spreading pathogens during construction.

Operational Impacts

Proposed Access Program, Fifield-Cahill Ridge Trail

Under the proposed access program, docent-led access and associated facilities maintenance activities would be expanded and increased supervised visitor traffic would be allowed through areas known to harbor sudden oak death and other plant pathogens. As noted above for project

construction, *Phytophthora* spp. are transported through natural mechanisms (e.g., wind and rain) as well as through human activities (e.g., pathogen-infected mud or vegetation carried on shoes or tires). While the current extent and rate of transmission within the watershed remains unknown, it is possible that with an increase in the number of visitors to the Fifield-Cahill ridge trail, the rate of transport and potential spread of *Phytophthora* spp. along the trail could also increase. For the same reasons described for project construction (e.g., devastating impacts on natural communities and difficulty controlling, once infested), the impact is considered significant.

Implementation of Mitigation Measure M-BI-7b, Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death), would reduce the potential significant effects of increased visitor access related to accelerated transmission of plant pathogens to a less-than-significant level by requiring signage and sanitation procedures for visitors entering and leaving each portion of the project area. Under the proposed access program, the trained docents would maintain current compliance with trail rules and adherence to additional sanitation procedures for visitors entering and leaving the trail segments.

Mitigation Measure M-BI-7b applies to operation of all project components.

Mitigation Measure M-BI-7b – Measures to Limit the Spread of Phytophthora spp. (including Sudden Oak Death).

- The SFPUC shall post signage along the southern skyline ridge trail requiring users to remain on the surfaced trail rather than venturing onto adjacent soil to prevent the spread of soil-borne pathogens.
- Based on the rate and extent of pathogen spread, the SFPUC may adopt further measures to reduce disease spread, such as the use of phytosanitizing wash stations at entrances for vehicles and individuals entering the Peninsula Watershed per the recommendations of the *Phytophthora* Working Group's Guidelines to Minimize *Phytophthora* Contamination in Restoration Projects, October 2016 (see Appendix D).
- Project staff and volunteers (e.g., docents) shall be trained to educate visitors about the need to avoid the spread of *Phytophthora* spp. and other pathogens, such as by not stepping in or riding through ponded water and mud and complying with phytosanitation measures, if implemented, before and after trail use.

Proposed Access Program, Southern Skyline Ridge Trail

Under the proposed access program, visitor access and associated facility maintenance activities would increase considerably over baseline conditions, as would visitor traffic through areas known to harbor *Phytophthora* plant pathogens. For the reasons described above for the proposed access program along Fifield-Cahill ridge trail (e.g., increased rate of transport and potential spread, devastating impacts of and difficulty controlling infestation), increased visitation under the proposed access program on the southern skyline ridge trail would similarly result in significant impacts related to the transport and spread of plant pathogens along this new trail corridor.

Mitigation Measure M-BI-7b, Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death), calls for signage and sanitation procedures for visitors entering and leaving each portion of the project area. Mitigation Measure M-BI-7c, Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens, provides for annual monitoring of near-trail vegetation for indications of pathogen infestation, and additional measures and/or corrective action in the event project-related spread is detected. For example, one option would be to add gravel or other restrictive measures to bare areas on the sides of the aggregate base trail surface to reduce the potential for contact with mud that could harbor and facilitate the transmission of the pathogen. Finally, Mitigation Measure M-BI-4, Operational Measures to Protect Sensitive Plant Species, requires informational signage to educate the public regarding potential recreational impacts on native vegetation, including plant pathogens, which would help keep visitors on designated trails, thereby further limiting the potential for accelerated spread of plant pathogens beyond the project area.

The above-listed measures would reduce the potential for accelerated spread of pathogens during project operations. While most visitors follow watershed rules, unsupervised access would lead to some degree of noncompliance, as noted in the findings of a recent survey of area land managers.[181] Under the proposed access program for the southern skyline ridge trail, with its permit and associated educational training requirements, adherence to watershed rules would likely be substantial. However, in the absence of supervision from docents, it cannot be concluded with certainty that all visitors under the proposed access program would comply with mandated pathogen control measures (e.g., sanitation measures). For these reasons, the potential for visitors to spread plant pathogens more rapidly via soil contact than under baseline conditions would remain considerable. Thus, under the proposed access program, even with implementation of the recommended mitigation measures, the impact remains significant and unavoidable with mitigation.

Mitigation Measures M-BI-7b, M-BI-7c, and M-BI-4 apply to operation of the project under the proposed access program and access program variants 2 and 3.

Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.

(See page 4.8-88 for a description of the mitigation measure.)

Mitigation Measure M-BI-7b – Measures to Limit the Spread of Phytophthora spp. (including Sudden Oak Death).

(See page 4.8-118 for a description of the mitigation measure.)

Mitigation Measure M-BI-7c – Measures to Monitor and Prevent Further Spread of Phytophthora spp. Pathogens.

- SFPUC maintenance staff shall monitor the condition of the trail edges on the southern skyline ridge trail. If monitoring identifies areas of exposed earth or mud adjacent to the trail where vegetation has been removed due to foot traffic beyond the 6-foot-wide aggregate base trail, additional gravel or other measures to prevent

[181] ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.

direct soil contact (e.g., signage, barriers) shall be placed in these locations to reduce the potential for spread of *Phytophthora* spp. pathogens.

- At least once, beginning one year before construction is completed, the SFPUC shall retain a qualified forest pathologist who is familiar with signs of *Phytophthora* damage to conduct a review of plant health along all portions of the southern skyline ridge trail, the Fifield-Cahill ridge trail, and Quarry Road. The forest pathologist shall test unhealthy trees and shrubs adjacent to the alignment for the presence of *Phytophthora* spp. pathogens This review shall be used to determine the baseline extent of the infestation and assess the rate of spread over the baseline rate. The forest pathologist shall establish permanent monitoring transects away from trails to examine the baseline tree infestation over time (i.e., the control area) to compare with transects in forested areas located adjacent to the trail segment with unsupervised access (i.e., southern skyline ridge trail and/or Fifield-Cahill ridge trail). The forest pathologist shall monitor *Phytophthora* infection conditions in each area for a period of at least five years. Monitoring data shall be evaluated using a statistical test, such as a t-test, to assess the potential rate of spread over the baseline rate. The SFPUC shall use this information to gauge the need to deploy measures to reduce spread, as presented in Measure M-BI-7b.

Access Program Variant 1, Fifield-Cahill and Southern Skyline Ridge Trails

Under access variant 1, project visitation, operations, and maintenance activities along the Fifield-Cahill and southern skyline ridge trails would be the same as described for the proposed access program along Fifield-Cahill ridge trail, above. Accordingly, for the reasons set forth in that impact discussion, the impact of access program variant 1 with respect to the transport and spread of plant pathogens would be significant. With docent supervision and implementation of Mitigation Measure M-BI-7b, Measures to Limit the Spread *Phytophthora* spp. (including Sudden Oak Death), the impact would be reduced to a less-than-significant level.

Mitigation Measure M-BI-7b applies to operation of the project under all access programs.

Mitigation Measure M-BI-7b – Measures to Limit the Spread of Phytophthora spp. (including Sudden Oak Death).

(See page 4.8-118 for a description of the mitigation measure.)

Access Program Variants 2 and 3, Fifield-Cahill and Southern Skyline Ridge Trails

Under access program variants 2 and 3, project visitation, operations, and maintenance activities would be the same as described for the proposed access program along the southern skyline ridge trail, above. Accordingly, for the reasons set forth in that impact discussion, the impact with respect to the transport and spread of plant pathogens along both Fifield-Cahill ridge trail and southern skyline ridge trail corridors would be significant. Mitigation Measures M-BI-7b, Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death); M-BI-7c, Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens; and M-BI-4, Operational Measures to Protect Sensitive Plant Species, would reduce the severity of the impact. However, in the absence of supervision (e.g., docents), and given that some degree of noncompliance is expected with unsupervised access, the full effectiveness of these measures

cannot not be assured. Therefore, the impact would remain significant and unavoidable with mitigation.

Mitigation Measures M-BI-7b, M-BI-7c, and M-BI-4 apply to operation of the project under access program variants 2 and 3 and the proposed access program.

Mitigation Measure M-BI-7b – Measures to Limit the Spread of *Phytophthora* spp. (including Sudden Oak Death).

(See page 4.8-118 for a description of the mitigation measure.)

Mitigation Measure M-BI-7c – Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens.

(See page 4.8-119 for a description of the mitigation measure.)

Mitigation Measure M-BI-4 – Operational Measures to Protect Sensitive Plant Species.

(See page 4.8-88 for a description of the mitigation measure.)

Impact Conclusion for the Proposed Access Program

Construction and operation of the project with the proposed access program along the Fifield-Cahill and southern skyline ridge trails could result in significant impacts on biological resources from invasive plants. Implementation of Mitigation Measure M-BI-7a would reduce impacts from invasive plants to a less-than-significant level. Construction and operation of the project with the proposed access program along the Fifield-Cahill and southern skyline ridge trails could also result in significant impacts on biological resources from pathogen spread. Implementation of Mitigation Measures M-BI-7b and M-BI-7c would reduce these impacts to a less-than-significant level on the Fifield-Cahill ridge trail; but on southern skyline ridge trail, due to the absence of docent supervision, impacts would remain significant and unavoidable with mitigation. For the reasons presented, with implementation of the recommended mitigation, operation of the project with the proposed access program would have significant and unavoidable impacts on the southern skyline ridge trail and less-than-significant with mitigation impacts on the Fifield-Cahill ridge trail.

Analysis of Construction Impacts Related to Conflicts with Local Policies or Ordinances Protecting Biological Resources

Impact BI-8: Construction of the project would not conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. (Less than Significant)

The San Mateo County Significant Tree Ordinance (Ordinance No. 3229, as amended) and Heritage Tree Ordinance (Ordinance No. 2427) regulate the trimming and removal of significant trees and heritage trees. The Heritage Tree Ordinance is not applicable to the project, because it

applies to public property that is owned by a public entity that is controlled or regulated by San Mateo County (section 11,050(j)).

The Significant Tree Ordinance's stated purposes is to protect against specified environmental consequences that could result from the indiscriminate removal or destruction of trees in San Mateo County (section 12,000). Among these consequences are modification of microclimates, change or elimination of animal habitats, and changes in soil conditions, among others. The ordinance provides that tree removal is permissible when necessary to utilize the property in a manner which is of greater public value than any environmental degradation caused by the removal (section 12,023(b)). The county defines a significant tree as a woody plant with a circumference of 38 inches or more measured 4.5 feet above ground. The ordinance exempts tree cutting on properties in a designated resource management district, such as the Peninsula Watershed, except within 100 feet of a state or county scenic road, such as S.R. 35.

On the Fifield-Cahill Ridge Trail, the SFPUC anticipates removing about 10-15 trees under the proposed access plan and variant 1, and roughly 30 more (about two per fence mile) under access variants 2 and 3. These trees are not subject to the county ordinance, because they are in a Resource Management District and not within 100 feet of a county road. On the southern skyline ridge trail alignment, the SFPUC anticipates having to remove about 125 trees. A small number (up to 5) of these trees are within 100 feet of S.R. 35 and all are less than 37.7 inches in circumference at 4.5 feet above ground. Therefore, none would not qualify as significant trees under the county ordinance.

While trees protect against modification of microclimates, loss of animal habitat, changes in soil conditions, risk of landslide, degradation of human habitat, and other environmental benefits—purposes for which the ordinance was adopted (section 12,000)—the limited number and small size of trees anticipated for removal within a heavily forested area would not materially affect these environmental factors. Furthermore, the project would add the public benefit of trail access to an area presently inaccessible to the general public, while maintaining the forest habitat of southern skyline boulevard, which is in keeping with the criteria for permitting tree removal under the ordinance (section 12,023(b)). For these reasons, the project would have a less than significant impact regarding conflicts with the Significant Tree Ordinance under all access variants.

Impact Conclusion for the Proposed Access Program

Construction of the project with the proposed access program along the Fifield-Cahill ridge trail and southern skyline ridge trail would not conflict with local policies or ordinances protecting terrestrial biological resources, such as a tree preservation policy or ordinance. The impact would be less than significant and no mitigation is required.

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Analysis of Cumulative Construction and Operational Biological Resources Impacts

Impact C-BI-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on biological resources. (Less than Significant for all Variants)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR. Table 4.1-1 lists the reasonably foreseeable projects in the vicinity of this project that were considered in the cumulative analysis. The geographic scope of these cumulative impacts is restricted to the drainage areas of the Upper and Lower Crystal Springs reservoirs where the southern skyline ridge trail and Fifield-Cahill ridge trail improvements would be located, as well as the drainage areas of Pilarcitos Reservoir and San Mateo Creek, where the Fifield-Cahill ridge trail is located. Biological resource impacts include the potential for loss of special-status plants or wildlife; degradation or loss of their habitat; degradation or reduction of the extent of sensitive natural communities, including wetlands; or adverse effects on wildlife movement.

Recent and reasonably foreseeable projects that could have impacts on biological resources that could combine with those of the project include: the S.R. 92 Bike Lanes Project; the Lower Crystal Springs Dam Bridge Replacement Project; and the Pacific Gas and Electric Company (PG&E) Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project. The Dam Bridge Replacement involved constructing a new replacement cast-in-place, post-tensioned, concrete-girder bridge on top of the Lower Crystal Springs Dam. The staging, concrete pouring, drainage, and paving for this project likely required temporary and permanent impacts on vegetation communities and special-status species habitat. The PG&E Gas Transmission Line project replaced approximately 4.7 miles of existing underground natural gas pipeline across SFPUC Peninsula Watershed lands. The installation of this pipeline involved temporary habitat disturbance and disturbance to wildlife. The impacts of these cumulative projects were likely similar to those anticipated for the project's construction and potentially significant, requiring similar mitigation. The S.R. 92 Bike Lanes Project would be limited to highway rights-of-way, mostly if not entirely beyond the watershed boundary. Construction of this cumulative project is not expected to have substantial biological resources impacts that could combine with those of the project. Similarly, this project would increase recreational opportunities in the vicinity of the project area, including to the proposed trails. However, given the existing heavy use of regional roads and trails by bicyclists, the effects of any incremental increase in recreational use of the project area that could result with this cumulative project would not be significant under all access variants.

Construction

As discussed in Impacts BI-1, BI-2, and BI-3, construction of the southern skyline ridge trail and the Fifield-Cahill ridge trail improvements would result in both temporary and permanent effects on biological resources in the watershed, including special-status plants, sensitive vegetation communities, special-status wildlife, nesting birds, and roosting bats. Project impacts would

include the permanent loss of sensitive vegetation communities and special-status wildlife habitat, and the temporary loss of habitat due to construction activities. As discussed, each of these impacts would be reduced to less-than-significant levels with recommended mitigation.

The Lower Crystal Springs Dam Bridge Replacement Project and PG&E Gas Transmission Line 109 Cañada Road, Bunker Hill, and Crystal Springs Pipeline Replacement Project might have involved temporary or permanent loss of sensitive natural communities and other habitat for special-status species, direct disturbance to special-status plants and wildlife, and spread of invasive species and plant pathogens within the watershed. These effects, would have generally been local, limited to the cumulative projects' disturbance areas, and have minimal overlap with the project.

The incremental contribution of the project's effects would not be cumulatively significant, considering the limited extent of cumulative project effects relative to the total watershed area, the temporary nature of the effects, and the minimal project area overlap. Moreover, these other cumulative projects were also required to comply with applicable federal and state regulations protecting special-status species and natural communities and likely implemented similar mitigation measures, which further reduces the potential for cumulative biological resources impacts.

Operation

The Lower Crystal Springs Dam Bridge Replacement Project facilitates continued recreational use of watershed lands, but does not connect with the project area. The S.R. 92 Bike Lanes Project would expand recreational opportunities in the project area, including by facilitating alternative means of accessing the project area. However, as noted previously, the incremental increase in visitation that could result would be negligible in effect.

As noted in Impacts BI-4, BI-5, and BI-7, project operations could result in significant impacts related to special-status plants, special-status wildlife, and the spread of invasive plants and plant pathogens. As discussed, implementation of recommended mitigation would reduce these impacts to less-than-significant levels, with the exception of impacts on special-status wildlife and the potential spread of plant pathogens under unsupervised access conditions. However, while the effects of these projects could overlap geographically, they would not be cumulatively significant because the projects would not substantially increase the extent or number of visitors to the project area or other areas of the watershed such that identified project impacts, such as the potential accelerated spread of *Phytophthora* pathogens (including sudden oak death), would be substantially greater. Moreover, visitors to the project area associated with the cumulative projects would be subject to the rules, restrictions, and mitigation measures established for the projects with the intent of reducing or avoiding adverse environmental effects.

Therefore, while the effects of the project and those of cumulative projects could overlap geographically, and could facilitate greater access to the project area or watershed, these effects would not result in a cumulatively significant biological resources impact for the reasons described above.

Mitigation: None required.

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4.9 Geology, Soils, and Paleontological Resources

This section describes the existing geological and paleontological environment in the project area and addresses the potential geologic, soils, and paleontological resource impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project with the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). Topics addressed in this section include: seismic impacts related to fault rupture; seismically induced groundshaking, ground failure (e.g., liquefaction), and landslides; soil erosion and loss of topsoil; construction on unstable soil or geologic units; alteration of site topography; and potential to encounter unique paleontological resources. Section 4.10, Hydrology and Water Quality, provides more discussion of erosion issues.

Of the comments received during the public scoping period, comments on the topic of geology and soils were generally about the effects of construction equipment and unsupervised access on soils. The impact analysis presented in Section 4.9.3, Impacts and Mitigation Measures, considers these comments.

4.9.1 Environmental Setting

This section discusses the geology, soils, and paleontological resources in the project area. The project area lies entirely within the geographic scope of the geology and soils setting described in the Peninsula Watershed Management Plan Environmental Impact Report (management plan EIR). As discussed more fully in the management plan EIR, the Peninsula Watershed is located within the Coast Ranges geomorphic province, in the Santa Cruz Mountains, which extends the length of the San Francisco Peninsula. The topography of the Peninsula Watershed is dominated by the northwest-trending rift valley of the San Andreas fault and several northwest-trending ridges that form generally rugged terrain.[1] The SFPUC would construct the proposed southern skyline ridge trail facilities along Skyline Ridge and the proposed Fifield-Cahill ridge trail improvements (i.e., universal access loop trail, parking lots, restroom, trailhead, fencing) along the Fifield and Cahill ridges. Figures 2-1 through 2-4 of Chapter 2, Project Description, show the regional and project features. The subsections below present site-specific information related to soils, geology, and paleontology.

[1] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (pp. III.C-1 to III.C-6). Planning Department Case No. 96.222E, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

4.9.1.1 Site Topography and Geology

Southern Skyline Ridge Trail

Elevations along the southern skyline ridge trail alignment vary from 878 feet above sea level at the northern limit to 2,065 feet above sea level at the trail route's southern terminus (Phleger Estate).[2] The topography of Skyline Ridge in the project area climbs steadily from north to south, typically at a 5 to 10 percent grade,[3] although the grade reaches 20 percent along the northernmost portion. The trail alignment generally follows the roadway, except where it must be built around existing private property lines or where it strays from the roadway to follow a spur ridge and old grade cut. The SFPUC would construct the majority of the trail on relatively level, natural slopes or existing *cut bench slopes*[4] of less than 5 percent, although the proposed trail alignment crosses slopes of 25 to 75 percent in the northernmost portion.

The proposed southern skyline ridge trail alignment crosses three different geologic units. The northernmost portion crosses mélange of Franciscan Complex bedrock that consists of Late Jurassic to Cretaceous age (164 to 100 million year old) sheared rock, predominantly *graywacke*,[5] siltstone, and shale, but also includes hard blocks of other rock types. South of these areas, the alignment crosses an unnamed Cretaceous sandstone and shale unit. And further to the south, the trail alignment crosses a younger, Tertiary-age (Middle to Lower Eocene) sandstone unit called the Whiskey Hill Formation. As also discussed in Section 4.11, Hazards and Hazardous Materials, the mélange of the Franciscan Complex bedrock sometimes contains naturally occurring asbestos. However, sampling conducted for the geotechnical investigation in this area did not detect asbestos in any of the four bedrock samples analyzed.[6]

In general, the depth to permanent groundwater beneath the proposed trail alignment is greater than 50 feet.[7] However, shallower groundwater is expected to accumulate seasonally in soils located near the bottom of major swales, such as North, Middle, South, and Maple Gulches, especially after periods of prolonged rainfall.

The Peninsula Watershed Management Plan identifies Erosion and Land Stability Sensitivity Zones, which are classified as high, moderate, or low sensitivity based on data related to slope, soil erodibility, and historical landslide activity.[8] Figure 4.9-1 shows these zones. Development activities in the high sensitivity zones have the greatest potential to result in soil erosion and land

2 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

3 A 5 percent grade means a change in elevation of 5 feet for every 100 feet.

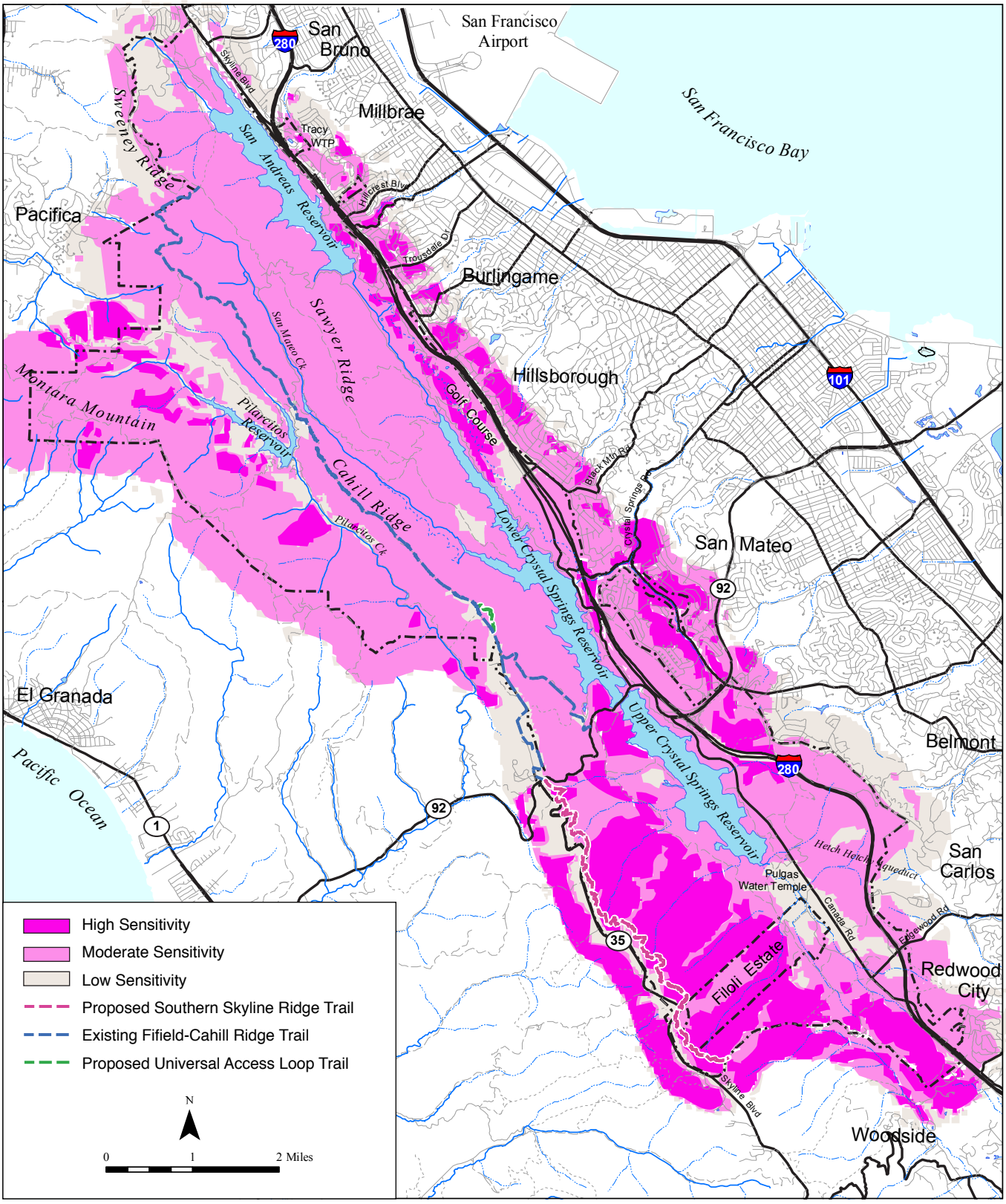
4 The result of cutting a section of trail or road across the slope, often requiring recontouring of the up- and down-slope portions of the hill to accommodate the "bench" formed by the trail or road cut.

5 Graywacke is coarse-grained sandstone with a silt and clay matrix.

6 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

7 Ibid.

8 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Figure 2-2, Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018.



Southern Skyline Boulevard Ridge Trail Extension

SOURCE: EDAW, Inc., 1998; ESA

Figure 4.9-1

Erosion and Land Stability Sensitivity Zones

instability. The southern skyline ridge trail would cross five areas of high erosion and land stability sensitivity, as shown on Figure 4.9-1. The remainder of the trail alignment would be located in areas of moderate erosion and land stability sensitivity.

Fifield-Cahill Ridge Trail Improvements

The setting description for the Fifield-Cahill ridge trail focuses on the locations where the SFPUC would construct the majority of the proposed improvements. Trail access program variant 2 (unsupervised/unrestricted access) and variant 3 (unsupervised/restricted access) would include new barbed-wire fencing along the Fifield-Cahill ridge trail between the Cemetery Gate and Portola Gate. The management plan EIR provides geologic setting information for the Fifield-Cahill ridge trail.[9] This setting section supplements that information for project sites where the EIR preparers identified the potential for effects related to soils, geology, or paleontological resources.

Elevations along the loop trail alignment range from 1,058 feet above sea level at the northernmost end to 1,064 feet above sea level at the southernmost end.[10,11] Between these two points, the trail traverses relatively gentle slopes at lower elevations. The grade of the proposed alignment ranges from approximately 4 to 5 percent. The trail alignment crosses slopes of up to 35 percent.

The trail alignment traverses sandstone of the Franciscan Complex bedrock—a rock unit that regionally consists of fine to coarse-grained sandstone interbedded with siltstone and shale.[12] The site of the proposed Fifield-Cahill parking lot is underlain by greenstone of the Franciscan Complex bedrock, which regionally consists of altered basaltic rocks as well as sandstone. As discussed in Section 4.11, Hazards and Hazardous Materials, the greenstone of the Franciscan Complex bedrock sometimes contains naturally occurring asbestos. The graywacke of the Franciscan Complex is overlain by approximately 1.5 to 3 feet of soil along the entire trail alignment. Geotechnical investigations determined that groundwater is deeper than 50 feet in this area.[13] All of the Fifield-Cahill ridge trail improvements would be located in areas of moderate erosion and land stability sensitivity identified in the management plan, as shown on Figure 4.9-1.

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9 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.C, Geology and Soils (pp. V-12 and V-13).

10 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California,* January 2016.

11 The project area north of S.R. 92 extends from Portola Gate to Skyline Quarry. However, the discussion of project impacts related to geology, soils, and seismicity focused on areas of substantial ground disturbance. Project areas beyond those described here (e.g., areas of proposed fencing along the Fifield-Cahill ridge trail) would either be the same or not affected, or both.

12 U.S. Geological Survey, *Geology of the Onshore Part of San Mateo County, California*. Derived from the Digital Database Open File 98-137.

13 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

4.9.1.2 Geologic Hazards

Slope Failure

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Exposed rock slopes undergo rockfalls, rockslides, or rock avalanches, while soil slopes experience soil slumps, rapid debris flows, and deep-seated rotational slides. Slope stability can depend on complex variables, including the site's geology and topography, the structure and geometry of the slope, and amount of groundwater present, as well as external processes such as climate and human activity. The factors that contribute to slope movements include those that decrease the resistance in the slope materials (such as water saturation) and those that increase the stresses on the slope (such as the construction of new facilities or use of heavy equipment that removes soil from the slope or increases loads at the top of the slope). Landslides typically occur within slide-prone geologic units that contain excessive amounts of water or are located on steep slopes, or where planes of weakness are parallel to the slope angle.

The best available predictor of where slides and earth flows might occur is the distribution of past movements.[14] In 1997, the U.S. Geological Survey (geological survey) released a preliminary map and geographic information system database that provides a summary of the distribution of landslides in the San Francisco Bay Region.[15] The map is a digitized nine-county compilation of existing landslides that divides the area into four landslide prevalence zones. The project would site the Fifield-Cahill ridge trail improvements and the majority of the southern skyline ridge trail alignment in areas mapped as "Few Landslides." The geological survey map defines these areas as containing few, if any, large landslides but as containing locally scattered, small landslides and questionably identified larger landslides. Near the northern southern skyline ridge trail trailhead at the California Department of Transportation (Caltrans) vista point parking area, the map identifies downslope areas as "Mostly Landslide." This classification refers to landslides with intervening areas that are typically narrower than 1,500 feet or to a group of mapped landslides.

The *factor of safety of a slope* is a measure of the stability of the slope under static (undisturbed) conditions. It is expressed as the ratio of resisting forces to driving forces. Landslides can occur when the driving forces are stronger than the resisting forces. Therefore, the smaller the factor of safety the less stable the slope. Under static conditions, a slope is considered unstable if the factor of safety is less than or equal to 1, because the driving forces equal or exceed the resisting forces. If the factor of safety is only slightly greater than 1, small disturbance—such as slight undercutting or steepening of the slope, very heavy rain, or seismic shaking—may cause a slope to fail. A geotechnical report for the project evaluates the stability of slopes in the northern

[14] Nilsen, T.H. and B.L. Turner, 1975. *Influence of Rainfall and Ancient Landslide Deposits on Recent Landslides (1950-71) in Urban Areas of Contra Costa County, California*, U.S. Geological Survey Bulletin 1388, 1975.

[15] United States Geological Survey, S*ummary Distribution of Slides and Earth Flows in the San Francisco Bay Region, California*, GIS database for Open File Report 97-745 Part C, by C.M. Wentworth, S.E. Graham, R.J. Pike, G.S. Beukelman, D.W. Ramsey, and A.D. Barron, 1997.

portion of the southern skyline ridge trail alignment and determines that, under existing conditions, the slopes have a factor of safety of between 1.25 and 1.28.[16]

Soils

The northern portion of the southern skyline ridge trail alignment and trailhead parking lot are primarily underlain by Barnabe-Candlestick Complex soils, and the southern portion is primarily underlain by Alambique-McGarvey Complex soils.[17] Some smaller areas of the southern skyline ridge trail alignment are also underlain by the Candlestick-Barnabe Complex soils. The loop trail alignment and four-stall parking lot site are located on soils of the Barnabe-Candlestick Complex, Candlestick-Kron-Buriburi Complex, and Alambique sandy loam.[18] The site of the proposed Fifield-Cahill ridge trail parking lot is underlain by soils characterized as Gazos Lobitos silty loam. As noted in the management plan EIR, all of these soils are well drained and highly erosive.[19]

4.9.1.3 Regional Faulting and Seismic Hazards

The geological survey estimates a high likelihood for a *moment magnitude scale* (M_w)[20] earthquake of 6.7 or higher on one of the California regional faults in the 30-year period between 2014 and 2044, with a 72 percent likelihood in the San Francisco region.[21] The geological survey considers the Hayward–Rodgers Creek and Calaveras faults to be particularly ready to rupture. The likelihood of a M_w 6.7 or higher earthquake on these faults before 2044 is 14.3 percent and 7.4 percent, respectively. The northern segment of the San Andreas fault is considered less likely to rupture, partly because of the relatively recent 1906 earthquake on that fault. The likelihood of a M_w 6.7 or higher earthquake on this fault before 2044 is 6.4 percent.

Fault Rupture

The sites of the southern skyline ridge trail and Fifield-Cahill ridge trail improvements are in a seismically active region, but these trails would not be located in an Alquist-Priolo Earthquake Fault Zone, as described below in Section 4.9.2, Regulatory Framework.[22] The two closest active faults are the San Andreas Fault in the valley of the Crystal Springs Reservoir, more than 1 mile to the east, and the San Gregorio Fault, more than 6 miles to the west. Therefore, the potential is

16 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

17 U.S. Department of Agriculture, Natural Resources Conservation Service, *Custom Soil Resource Report for San Mateo Area, California; and San Mateo County, Eastern Part, and San Francisco County, California, Southern Skyline Boulevard Ridge Trail Extension*, December 16, 2016.

18 Ibid.

19 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (p. III.C-3).

20 An earthquake is classified by the amount of energy released, expressed as the magnitude of the earthquake. Traditionally, magnitudes have been quantified using the Richter scale. However, seismologists now use a moment magnitude (Mw) scale because it provides a more accurate measurement of the size of major and great earthquakes. Moment magnitude is directly related to the average slip and fault rupture area.

21 U.S. Geological Survey and U.S. Department of the Interior, *UCERF3: A New Earthquake Forecast for California's Complex Fault System. Fact Sheet 2015–3009*, March 2015.

22 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

low for fault rupture along the proposed southern skyline ridge trail alignment and in the vicinity of the Fifield-Cahill ridge trail improvements.

Groundshaking

The intensity of the seismic shaking, or strong ground motion, during an earthquake affecting the project area would depend on the distance to the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the area. Earthquakes on faults closest to the project area would have the potential to generate the largest ground motions.

Geologists describe the intensity of earthquake-induced ground motions and the potential forces that could affect structures in terms of *peak ground acceleration*, which is represented as a fraction of the acceleration of gravity.[23] The geotechnical reports for the project estimate that the peak horizontal ground acceleration in the project area would be 1.07g.[24] This level of ground acceleration correlates to a shaking intensity on the *modified Mercalli intensity scale*[25]of IX to XI (violent to extreme). At the intensity identified in the geotechnical reports (IX to XI), many or most structures would be totally damaged.

Liquefaction

Liquefaction is a form of seismically induced ground failure. It is a phenomenon in which saturated granular sediments temporarily lose their *shear strength*[26] during periods of strong groundshaking, such as during an earthquake. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude of earthquakes likely to affect the site. Saturated, unconsolidated silts, sands, silty sands, and gravels within 50 feet of the ground surface are the most susceptible to liquefaction. Liquefaction-related phenomena include vertical settlement from *densification*, *lateral spreading*, *ground oscillation*, *flow failures*, *loss of bearing strength*, *subsidence*, and *buoyancy effects*.[27]

The geological survey classifies liquefaction susceptibility for specific geologic units according to five categories (very low to very high). These categories are based on quantitative factors, such as the history of liquefaction, the strength of shaking required to produce liquefaction, and the typical

[23] The acceleration of gravity (g) = 980 centimeters per second squared; 1 g of acceleration is the rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

[24] AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

[25] The modified Mercalli intensity scale is a seismic intensity scale used for measuring the intensity of shaking produced by an earthquake; the scale spans from I (not felt) to XII (very violent).

[26] Shear strength is the frictional strength between grains to resist movement from outside forces.

[27] Densification is the process of increasing the density of a material through compaction or compression. Lateral spreading is the finite, lateral movement of gently to steeply sloping, saturated soil deposits caused by earthquake-induced liquefaction. Ground oscillation is the movement of a surface layer over a buried liquefied layer, that is thrown back and forth by the shaking and can be severely deformed. Flow failures are a form of slope movement involving the transport of earth materials in a fluid manner over distances of at least several tens of feet. Loss of bearing strength is the loss of friction between grains of unconsolidated materials that provide structural support. Subsidence is the sudden sinking or gradual downward settling of subsurface materials with little or no lateral movement. Buoyancy effects are the upward acting forces caused by the fluid nature of the liquefied sediments.

depth to groundwater.[28] The southern skyline ridge trail and Fifield-Cahill ridge trail improvements are located in areas of very low liquefaction susceptibility. The geotechnical reports for the project estimate that the potential for liquefaction in the project area is low based on the dense soils encountered and because historical groundwater levels are deeper than 50 feet.[29,30]

Seismically Induced Densification

Seismic densification is a form of seismically induced ground failure. The densification occurs when loose granular soils above the water table increase in density as a result of earthquake shaking. The sandy soils most susceptible to seismically induced densification are loose, clean, uniformly graded sands. Seismic densification can result in uneven settlement of the soil, which can damage structures and surface features such as trails. The geotechnical reports for the project conclude that seismically induced settlement during seismic events along the proposed trail alignments would be less than 0.5 inch.[31,32] The seismically induced differential settlement would be less than 0.25 inch over 100 lineal feet.

Seismic Slope Stability

Earthquake motions can also induce substantial stresses in slopes, causing earthquake-induced landslides or ground cracking when the slope fails. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake. The 1989 Loma Prieta earthquake triggered thousands of landslides over an area of 770 square miles.

The geological survey has mapped several areas downslope of the southern skyline ridge trail alignment as having a moderate susceptibility, or a 15 percent chance of slope failure, in the event of a major earthquake.[33] The remainder of the southern skyline ridge trail alignment and associated facilities are located in areas mapped as having a low susceptibility, or up to 5 percent chance of slope failure. The geotechnical report for the southern skyline ridge trail evaluates the susceptibility of the slopes in the northernmost portion of the southern skyline ridge trail alignment and concludes that the slopes could experience about 1 to 2 feet of lateral deformation in the event of a major earthquake.[34]

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28 U.S. Geological Survey, *Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region, California. Liquefaction Susceptibility*. Geology by Robert C. Witter, Keith L. Knudsen, Janet M. Sowers, Carl M. Wentworth, Richard D. Koehler, and Carolyn E. Randolph. Digital Database by Carl M. Wentworth, Suzanna K. Brooks, and Kathleen D. Gans, Open File Report 06-1037, 2006.

29 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

30 AGS, *Draft Geotechnical Study Report, Southern Skyline Boulevard Cahill Trail Extension, San Mateo County, California*, December 2016.

31 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

32 AGS, *Draft Geotechnical Study Report, Southern Skyline Boulevard Cahill Trail Extension, San Mateo County, California*, December 2016.

33 U.S. Geological Survey, *Map Showing Slope Stability During Earthquakes in San Mateo County, California, Miscellaneous Investigation Series, Map I-257-E*, 1985.

34 AGS, *Draft Geotechnical Study Report, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, April 2013.

The area downslope of the loop trail is also mapped as having a high susceptibility, or up to a 25 percent chance of slope failure in the event of a major earthquake.[35] The remainder of the Fifield-Cahill ridge trail improvements would be constructed within areas of low susceptibility to seismically induced slope failure.

4.9.1.4 Paleontological Resources

Paleontological resources are the fossilized remains of plants and animals, including vertebrates (animals with backbones), invertebrates (e.g., starfish, clams, ammonites, and marine coral), and fossils of microscopic plants and animals (microfossils). The age and abundance of fossils depend on the location, topographic setting, and particular geologic formation in which they are found. Fossil discoveries provide a historical record of past plant and animal life and can assist geologists in dating rock formations. In addition, fossil discoveries can expand the understanding of the time periods and geographic range of existing and extinct flora or fauna.

Assessment Standards

The Society of Vertebrate Paleontology has established guidelines for the identification, assessment, and mitigation of adverse impacts on nonrenewable paleontological resources.[36] The guidelines outline criteria for screening the potential of rock units to contain paleontological resources and establish assessment and mitigation procedures tailored to accommodating such potential. The criteria for paleontological potential are as follows:

- **High Potential.** Geologic units from which vertebrate or significant invertebrate or plant fossils have been recovered in the past; or rock formations that would be of a type and age suitable for the preservation of fossils. Only invertebrate fossils that provide new information on existing flora or fauna or on the age of a rock unit would be considered significant.
- **Undetermined Potential**. Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study would be necessary to determine if these rock units have high or low potential to contain significant paleontological resources.
- **Low Potential.** Geologic units that are not known to have produced a substantial body of significant paleontological material, as demonstrated by paleontological literature and prior field surveys, and that are poorly represented in institutional collections.
- **No Potential**. This designation is assigned to geologic formations that are entirely *plutonic* (volcanic rocks formed beneath the earth's surface) in origin and therefore have no potential for producing fossil remains.

[35] U.S. Geological Survey, *Map Showing Slope Stability During Earthquakes in San Mateo County, California, Miscellaneous Investigation Series, Map I-257-E*, 1985.

[36] Society of Vertebrate Paleontology, *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources*, 2010.

Paleontological Sensitivity of Geologic Units at Project Site

As discussed above, the proposed southern skyline ridge trail alignment crosses three different geologic units. The northernmost portion crosses mélange of Franciscan Complex bedrock that consists of Late Jurassic to Cretaceous age sheared rock. Immediately south of the Caltrans parking area, the alignment crosses an unnamed Cretaceous sandstone and shale unit. And further to the south, the trail alignment crosses a younger, Tertiary-age (Middle to Lower Eocene) sandstone unit called the Whiskey Hill Formation. The Fifield-Cahill ridge trail improvements would be constructed in graywacke and greenstone of the Franciscan Complex bedrock.

The EIR preparers performed a search of the paleontological locality database of the University of California Museum of Paleontology that identified over 100 *Foraminifera* fossil localities in Eocene-aged sediments in the Woodside Area, to the south of the southern skyline ridge trail.[37] Foraminifera are single-celled organisms with shells or tests (a technical term for internal shells) and are not vertebrates.[38] They are abundant as fossils for the last 540 million years. Based on its age, the Whiskey Hill Formation could include Foraminifera fossils. However, this rock unit is not considered to have a high potential for paleontological resources because no vertebrate fossils have been identified in similarly aged rock units in the project area. Further, Foraminifera fossils are abundant, their presence would not be noteworthy, and they would not likely provide new information on existing flora or fauna or on the age of the Whiskey Hill Formation.

Sedimentary rocks of the Franciscan Complex have produced significant fossils important for understanding the age, depositional environments, and tectonic history of the San Francisco area, including microscopic fossils, *radiolarians*,[39] and rare *macrofossils*.[40,41] Of the Franciscan Complex units identified in the project area, only the graywacke that underlies the loop trail alignment and four-stall parking lot site is a sedimentary rock, and this unit would have a high potential for paleontological resources. The sites of other Fifield-Cahill ridge trail improvements are underlain by the greenstone of the Franciscan Complex, which consists of volcanic rocks, and the mélange is substantially sheared. Therefore, these units would have a low to no potential for paleontological resources.

No vertebrate fossil localities have been identified in Cretaceous age sediments in San Mateo County.[42] Therefore, the unnamed Cretaceous sandstone and shale unit would have a low potential for paleontological resources.

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37 University of California Museum of Paleontology, *UCMP Specimen Search*, *http://ucmpdb.berkeley.edu/*, accessed on March 29, 2017.

38 University of California Museum of Paleontology, *Foram Facts – an Introduction to Foraminifera*, n.d., *http://www.ucmp.berkeley.edu/fosrec/Wetmore.html*, accessed on January 10, 2017.

39 A single-celled aquatic animal that has a spherical, amoeba-like body with a spiny skeleton of silica.

40 Fossils large enough to be visible without a microscope.

41 University of California Museum of Paleontology, *Golden Gate National Recreation Area*. n.d., *http://www.ucmp.berkeley.edu/science/parks/golden_gate.php*, accessed on March 27, 2017.

42 University of California Museum of Paleontology, *UCMP Specimen Search*. *http://ucmpdb.berkeley.edu/*, accessed on March 29, 2017.

4.9.2 Regulatory Framework

4.9.2.1 Federal Regulations

Federal Occupational Safety and Health Administration Regulations

The Federal Occupational Safety and Health Administration's Safety and Health Regulations for Construction, title 29 of the Code of Federal Regulations, part 1926.650, address requirements for excavation and trenching operations. The health administration requires that projects implement measures to protect workers from cave-ins during excavation activities by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. These regulations apply to the project because of the proposed excavation activities.

4.9.2.2 State Regulations

Alquist-Priolo Earthquake Fault Zoning Act

As described in the management plan EIR, the Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting in structures for human occupancy.[43] The act does not apply to the project because no active faults cross the project site, and the project does not include the construction of any structures for human occupancy.[44]

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. The project would not be subject to this act because it does not include the construction of any structures for human occupancy and does not cross any zones of potential liquefaction mapped by the geological survey.

California Occupational Safety and Health Administration Regulations

The California Code of Regulations, title 8, subchapter 4, article 6 specifies excavation safety regulations. The State of California Department of Industrial Relations implements these regulations, which incorporate the federal Safety and Health Regulations for Construction (29 Code of Federal Regulations 1926.650). The California excavation safety regulations address shoring requirements to maintain stability in soil excavations and apply to the project because of the proposed excavation activities.

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43 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (p. III.C-6).

44 California Geological Survey, *Table 4, Cities and Counties Affected by Alquist-Priolo Earthquake Fault Zones as of January 2010*, 2010, *http://www.conservation.ca.gov/cgs/rghm/ap/pages/affected.aspx*, accessed on August 9, 2016.

4.9.2.3 Local Regulations

There are no local regulations related to geologic resources that apply to this project.

4.9.3 Impacts and Mitigation Measures

4.9.3.1 Significance Criteria

The project would have a significant effect related to geology, soils, and paleontological resources if it were to:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);
  - Strong seismic groundshaking;
  - Seismic-related ground failure, including liquefaction; or
  - Landslides;
- Result in substantial soil erosion or the loss of topsoil;
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse;
- Be located on expansive soil, as defined by the San Francisco Building Code, creating substantial risks to life or property;
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater;
- Change substantially the topography or any unique geologic or physical features of the site; or
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

Due to the location and nature of the project and for the reasons described below, there would be no impacts related to the following significance criteria; therefore, these criteria are not discussed further.

- ***Risk of loss, injury, or death involving fault rupture and liquefaction or other seismically induced ground failures.*** The management plan EIR analysis concludes that, given the relatively small additional number of people who might experience exposure to seismic hazards while in the watershed, seismic hazards as a result of fault rupture and liquefaction would be less than significant.[45] The project area is not traversed by an active fault, and all of

[45] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (p. III.C-13); Section V.C, Geology and Soils (p. V-14).

the proposed trail facilities are located in areas of very low liquefaction susceptibility.[46] As described in Section 4.9.1.3, *Regional Faulting and Seismic Hazards*, settlement due to seismic densification would be 0.5 inch or less. Further, the project would not exacerbate any conditions related to fault rupture or seismically induced ground failure. Therefore, this section does not further discuss construction or operational impacts related to fault rupture and seismic-related ground failures.

- ***Risk of loss, injury, or death involving seismic groundshaking and seismically induced landslides during project construction.*** The project is located in a seismically active region and could experience groundshaking and seismically induced landslides. However, construction would occur over a relatively short period of time, and there would be a low potential for a major earthquake during the construction period. Therefore, project construction would not exacerbate conditions related to groundshaking and seismically induced landslides, and this section does not further discuss these construction-related impacts. Impact GE-5 evaluates the potential for these impacts to occur during operation of the project.

- ***Risks to life and property due to location on expansive soils.*** The geotechnical reports for the project indicate that based on laboratory analysis, the site soils are not considered expansive, and there would be no impact related to construction on expansive soils during either construction or operation.[47]

- ***Soils incapable of adequately supporting use of septic tanks or alternative wastewater disposal systems.*** The project calls for pit toilets that would use containment vaults to temporarily store human wastes. Vendors would periodically pump out the vaults and dispose of the wastes at an offsite facility, as discussed in Chapter 2, Project Description. Therefore, the project would not use septic tanks or other onsite wastewater disposal systems, and there would be no impact related to the adequacy of soils to support such systems during construction or operation.

- ***Substantial change to any unique geologic or physical features.*** The project site does not contain any unique geologic or physical features. Therefore, there would be no impact related to substantial changes to such features during construction or operation.

- ***Directly or indirectly destroy a unique paleontological resource or geologic feature during project operations.*** Once constructed, the project would not require any soil excavation or other activities that would disturb any geologic units in the project vicinity. Therefore, there would be no impact related to the destruction of paleontological resources or unique geologic features during project operation. Impact GE-4 addresses construction impacts related to this topic.

4.9.3.2 Approach to Analysis

Project Impacts

This analysis evaluates the project's potential construction and operational effects related to geology, soils, and paleontological resources. As discussed in Section 4.5, Noise and Vibration (in Section 4.5.3.2, *Approach to Analysis*), CEQA does not require lead agencies to consider how existing hazards or conditions might affect a project's users or residents, except where the project would

46 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

47 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

significantly exacerbate an existing environmental hazard. Accordingly, hazards resulting from a project that places development in an existing or future seismic hazard area or an area with unstable soils are not considered impacts under CEQA unless the project would significantly exacerbate the seismic hazard or unstable soil conditions. Thus, the analysis below evaluates whether the project would exacerbate future seismic hazards or unstable soils at the project site and result in a substantial risk of loss, injury, or death. The impact is considered significant if the project would exacerbate existing or future seismic hazards or unstable soils by increasing the severity of such hazards that would exist without the project.

In addition, this section addresses potential impacts related to soil erosion, loss of topsoil, construction on unstable geologic units, and alteration of topography. The impact analysis assumes the SFPUC would construct the proposed improvements in accordance with the recommendations of the site-specific geotechnical reports prepared for the project and stormwater permitting requirements. For the purpose of this analysis, if compliance with these standards ensures that impacts related to geology and soils would be less than significant, then no mitigation is required.

Impacts on paleontological resources are assessed with respect to the potential to encounter unique or uncommon paleontological resources such as vertebrate fossils. If prior projects or activities have not historically encountered unique or uncommon fossils at the project site or vicinity in the geologic units that would be disturbed during construction, the potential to encounter paleontological resources is considered low. In such cases, impacts related to paleontological resources are considered less than significant.

The SFPUC conducted geotechnical investigations to evaluate geologic conditions and potential geologic hazards along the proposed southern skyline ridge trail and Fifield-Cahill ridge trail alignments and improvement areas. [48, 49] The impact analyses below rely on the information presented in the reports of these investigations. While the SFPUC would conduct additional investigations to refine the project design prior to construction, these existing reports provide adequate descriptions of geologic conditions and potential seismic hazards at a level of detail that is appropriate for the EIR analysis.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. Although the entire Bay Area is located within a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions, the geographic scope of potential geology, soils, and paleontological impacts is restricted to the project site and immediate vicinity, because related risks are relatively localized or even site-specific. The cumulative analysis of potential geology, soils, and paleontological impacts 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. Similar to

48 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

49 AGS, *Draft Geotechnical Study Report, Southern Skyline Boulevard Cahill Trail Extension, San Mateo County, California*, December 2016.

the analysis for project impacts, the cumulative impact analysis assumes that construction and operation of other projects in the immediate vicinity would also be completed in compliance with design standards as well as stormwater permitting requirements, which would serve to avoid and reduce many impacts to less-than-significant levels on a project-by-project basis.

The cumulative analysis considers whether there would be a significant, adverse cumulative impact associated with project implementation in combination with the effects of proximate 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 they are deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.9.3.3 Impact Summary

Table 4.9-1 summarizes the impacts of the project related to geology, soils, and paleontological resources. The impact summary table provides separate significance determinations for the proposed access program, access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access).

TABLE 4.9-1
SUMMARY OF IMPACTS – GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact GE-1: Project construction would not result in substantial erosion or loss of topsoil during construction.	LS	LS	LS	LS
Impact GE-2: The project is located on a geologic unit that is potentially unstable, but would not increase the potential for landsliding, collapse, or other slope failures during construction.	LS	LS	LS	LS
Impact GE-3: Construction of the project would not substantially alter the topography of the proposed trail alignment.	LS	LS	LS	LS
Impact GE-4: The project would not directly or indirectly destroy a unique paleontological resource during construction.	LS	LS	LS	LS
Impact GE-5: The project would not expose people or structures to the risk of loss, injury, or death involving seismic groundshaking, seismically induced landslides, or potentially unstable geologic units during operation.	LS	LS	LS	LS

TABLE 4.9-1 (CONTINUED)
SUMMARY OF IMPACTS – GEOLOGY, SOILS, AND PALEONTOLOGICAL RESOURCES

Impacts	Significance Determinations			
	Proposed Access Program	Access Program Variant 1 (Docent Program)	Access Program Variant 2 (Unsupervised/ Unrestricted Access)	Access Program Variant 3 (Unsupervised/ Restricted Access)
Impact GE-6: Runoff from the permanent project components would not result in substantial erosion or loss of topsoil during operation.	LS	LS	LS	LS
Impact GE-7: Use of the trails under the proposed access program and variants would not result in substantial erosion or loss of topsoil during operation.	LS	LS	LS	LS
Impact C-GE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on geology, soils, or paleontological resources.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required

4.9.3.4 Impact Analysis

Construction Impacts

Impact GE-1: Project construction would not result in substantial erosion or loss of topsoil during construction. (Less than Significant)

Erosion

Without proper controls, activities such as clearing, grubbing, grading, and earthmoving for construction of project components (e.g., staging areas, trails, parking areas, access drives, fencing, and restrooms) could increase the potential for exposed soils to be eroded by wind or stormwater runoff, resulting in long-term soil loss. The management plan EIR concludes that these geologic effects would be less than significant with implementation of the policies and management actions of the management plan, as described in Program-Level Mitigation Measure C.1.[50] This mitigation measure calls for implementation of the plan's relevant policies and management actions, such as a grading plan and erosion control measures. These policies and management actions, referenced in Program-Level Mitigation Measure C.1, are designed to prevent significant geologic impacts in a manner that is now accomplished through mandatory compliance with regulatory requirements, such as the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and Order 2012-0006-DWQ (construction general permit; see Section 4.10, Hydrology and Water Quality, for additional discussion). Accordingly, implementation of the project would not result in significant geologic impacts as a result of construction-related erosion, because the project would be

50 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (pp. III.C-7 to III.C-17); Section V.C, Geology and Soils (pp. V-13 and V-14).

subject to the construction general permit requirements. As discussed further in Section 4.10, Hydrology and Water Quality (Impact HY-1), the permit requires project proponents to prepare and implement a stormwater pollution prevention plan for projects that would disturb a land area of greater than 1 acre. The plan must specify best management practices for implementation during construction to minimize stormwater runoff and associated effects, including erosion. Examples of erosion control measures that could be implemented through the plan include providing a positive slope away from cut slopes to carry runoff water away from the slopes; providing erosion control on all cut-and-fill slopes; protecting slopes from erosion during the wet season; and maintaining all landscaped slopes in a vegetated state after project completion. Implementation of erosion control measures in accordance with the construction general permit would reduce potential geologic impacts related to erosion to less-than-significant levels during construction for the proposed access program and variants. Therefore, compliance with existing regulations fulfills the intent of Program-Level Mitigation Measure C.1, and no mitigation is necessary.

Loss of Topsoil

As discussed in Chapter 2, Project Description, project construction would require ground disturbance over an area of approximately 32 acres. Upon the completion of construction, the SFPUC would return the 24 acres temporarily disturbed during construction activities to their approximate preconstruction condition. Workers would replace the topsoil/mulch removed in preparing these areas for construction and hydroseed the disturbed area with a native seed mix, as described in Chapter 2, Project Description.

The project would permanently disturb approximately 7.9 acres of watershed land, some of which would occur along the southern skyline ridge trail and the loop trail, but also for construction of the associated parking areas, access drives, restrooms, and fencing. Within these areas, the SFPUC would remove the soils that are not geotechnically suitable for supporting the proposed improvements. While this removal would result in the permanent loss of topsoil in the approximately 7.9-acre area, work crews would replace it with engineered fill and cover the area with impervious surfaces designed to prevent any further loss of topsoil due to erosion (see Section 4.10, Hydrology and Water Quality, for further discussion of drainage control requirements). Therefore, construction of the project under the proposed access program and variants would not result in substantial adverse effects related to the loss of topsoil, and the impact would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to erosion or loss of topsoil. No mitigation is required.

Impact GE-2: The project is located on a geologic unit that is potentially unstable, but would not increase the potential for landsliding, collapse, or other slope failures during construction. (Less than Significant)

Landslides are common in areas of steep slopes or unstable, saturated soils. As discussed in Section 4.9.1.2, *Geologic Hazards*, the northernmost portion of the southern skyline ridge trail alignment is located immediately upslope of areas the geological survey has mapped as "Mostly Landslide." Existing slopes in these areas are typically 25 to 75 percent. These areas could potentially become unstable during construction of the southern skyline ridge trail because excavation could exacerbate the potential for landsliding.

However, as summarized in the geotechnical report for the southern skyline ridge trail, temporary excavations conducted for construction of the proposed trail and facilities must comply with state health and safety agency requirements. Contractors would shore or slope qualifying excavations (e.g., trenches greater than 4 feet deep or exposed slopes that could result in falling loads) in accordance with California Department of Industrial Relations requirements specified in title 8 subchapter 4 (Construction Safety Orders) of the California Code of Regulations. The design of the shoring would take into account the potential pressures from the adjacent slopes along with pressures that would result from the use of construction equipment and stockpiling of soil. The construction contractor would determine the shoring design and present it in the final shoring plans and specifications, which would be subject to review by the SFPUC. The prefabricated bridge would have four 2-foot-diameter piers on each side covered with pile caps approximately 2 feet deep. To ensure long-term stability, the contractor would drill the piers 5 to 10 feet into the underlying rock, approximately 20 to 30 feet below the ground surface (see Section 2.6.5, Avoidance of Wetlands and Bridge Installation), consistent with standard geotechnical engineering practices and in accordance with California Building Code requirements.

In accordance with the geotechnical report, the construction contractor would also implement a monitoring program to observe for potential settlement of adjacent roadways, pavements, and utilities in the vicinity of project-related excavations. The monitoring program would establish reference points along the shoring system for comparison with existing conditions prior to construction. The SFPUC would periodically monitor these points for movement and take corrective actions in the event that large movements are detected. Corrective actions could include providing additional shoring or underpinning the adjacent structures.

With implementation of shoring (as required by the state health and safety agency and specified in the geotechnical report), in addition to settlement monitoring (as specified in the geotechnical report), project construction under the proposed access program and variants would not result in substantial adverse effects related to slope instability, and impacts be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to geologic hazards. No mitigation is required.

Impact GE-3: Construction of the project would not substantially alter the topography of the proposed trail alignment. (Less than Significant)

As discussed in Chapter 2, Project Description, the southern skyline ridge trail would be located along Skyline Ridge. The majority of the southern skyline ridge trail would be constructed on relatively level natural slopes or existing cut bench slopes of less than 5 percent. Where the proposed southern skyline ridge trail alignment crosses slopes of 25 to 75 percent in the northernmost portion, the SFPUC would cut the trail into the slope and install retaining walls and terraces as needed to maintain stable slopes. Similarly, the loop trail would involve minor cuts into the existing slope and would generally follow the existing topography. The prefabricated bridge would be constructed over a steep gully, and be supported by four piers drilled into the underlying bedrock. These improvements would not substantially alter the topography of the trail alignments. The SFPUC would construct the new parking areas on relatively flat ground surfaces, which would require minor grading only (up to 9 inches). Therefore, project construction under the proposed access program and variants would not result in substantial adverse effects related to the alteration of topography, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail alignments would result in less-than-significant impacts related to the alteration topography. No mitigation is required.

Impact GE-4: The project would not directly or indirectly destroy a unique paleontological resource during construction. (Less than Significant)

As discussed in Section 4.9.1.4, *Paleontological Resources*, the southern skyline ridge trail alignment, 20-stall parking area, and ancillary features would cross the Whiskey Hill Formation, an unnamed Cretaceous sandstone and shale unit, and mélange of the Franciscan Complex, which have a low potential for paleontological resources based on Society for Vertebrate Paleontology criteria. Similarly, as part of the Fifield-Cahill ridge trail improvements, the SFPUC would install the new restroom facility and the majority of the 50-stall parking area within greenstone of the Franciscan Complex bedrock, which also has low potential for paleontological resources. Parking area construction would require only limited grading within the sandstone of the Franciscan Complex bedrock, which would have a low potential to encounter paleontological resources.

The SFPUC would construct the proposed loop trail and four-stall parking lot within sandstone of the Franciscan Complex, which has a high potential for paleontological resources. While the sedimentary rocks of the Franciscan Complex bedrock have produced significant fossils in other localities, none of these localities are in the vicinity of the project. Further, construction of the loop trail and four-stall parking lot would involve excavation to a maximum depth of 12 inches, which would not likely encounter bedrock because a 1.5- to 3-foot-thick soil horizon overlies the bedrock along the trail alignment.[51] Therefore, the potential to encounter paleontological resources during construction of the loop trail and four-stall parking lot is low.

Under access program variants 2 and 3, the SFPUC would install fencing along the Fifield-Cahill ridge trail between the Portola Gate and Cemetery Gate, encompassing the loop trail. Construction would require excavation to a depth of approximately 4 feet at small, discrete locations to install fence posts. Therefore, the potential to encounter paleontological resources during fence installation is low. Under the proposed access program and access program variant 1, no fencing would be installed along the Fifield-Cahill ridge trail.

For the reasons stated above, project construction would not result in a substantial adverse effect related to the destruction of a unique paleontological resource, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to the direct or indirect destruction of a unique paleontological resource. No mitigation is required.

Operational Impacts

Impact GE-5: The project would not expose people or structures to the risk of loss, injury, or death involving seismic groundshaking, seismically induced landslides, or potentially unstable geologic units during operation. (Less than Significant)

Seismic hazards related to the project include the potential for seismic groundshaking and earthquake-induced landslides. Even in the absence of a seismic event, unstable slopes could fail as a result of normal gravitational forces.

Seismic Groundshaking

The management plan EIR acknowledges that increased public activity in the watershed would expose more people and facilities to hazards during a seismic event, including groundshaking

[51] AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

and landsliding, but concluded that impacts related to seismic hazards would be less than significant because of the small number of additional people who might be exposed to seismic hazards.[52] Similarly, the proposed southern skyline ridge trail and Fifield-Cahill ridge trail improvements could experience violent to extreme groundshaking in the event of a major earthquake on one of the regional faults, as described in Section 4.9.1.3, *Regional Faulting and Seismic Hazards*. However, neither the proposed access program nor the variants include any substantial new structures or operational activities that could create or exacerbate a groundshaking hazard risk to the surrounding population, including trail users. Therefore, impacts related to seismic groundshaking during project operation would be less than significant for the proposed access program and variants.

Earthquake-Induced Landslides and Potentially Unstable Geologic Units

Landslides, including seismically induced landslides, are common in areas of steep slopes or unstable, saturated soils. As discussed in Section 4.9.1.3, *Regional Faulting and Seismic Hazards*, the geological survey has mapped areas of moderate susceptibility to earthquake-induced landslides in the northernmost section of the southern skyline ridge trail alignment and downslope of the proposed loop trail. Following construction, the presence of the proposed southern skyline ridge trail and loop trail could exacerbate the potential for earthquake-induced landslides in these areas. Because the proposed access program and variants would involve the same trails, this impact would be the same regardless of access program type.

The management plan EIR notes that slope instability leading to landslides would continue within the watershed once new facilities were constructed.[53] To address the potential for such effects, the management plan EIR recommends Program-Level Mitigation Measure C.2, which calls for appropriate design of roads and implementation of appropriate erosion control measures. Since certification of the management plan EIR, the SFPUC has developed additional site-specific and project-level details that indicate project implementation would not result in substantial slope instability leading to landslides, as discussed below.

As described in Chapter 2, Project Description (Section 2.5.1, Trail Improvements and Expansions), the project includes the six retaining walls to stabilize the existing slopes and support the proposed southern skyline ridge trail. The SFPUC would construct four retaining walls near the northern trailhead at the Caltrans vista point parking area and two retaining walls to the south, along the middle stretch of the trail alignment. Trail improvements also include a prefabricated bridge to span a steep gully. Bridge installation would require four 2-foot-diameter piers be drilled 5 to 10 feet into the underlying bedrock, approximately 20 to 30 feet below the ground surface.

The SFPUC would design and install the bridge as well as the retaining walls and associated foundation systems in accordance with the recommendations of the geotechnical report(s), which provide estimated uplift capacities and lateral earth pressures. Compliance with the geotechnical

[52] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (pp. III.C-13); Section V.C, Geology and Soils (p. V-14).

[53] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C., Geology and Soils (pp. III.C-11).

recommendations would reduce the potential for the slopes to become unstable during an earthquake on one of the regional faults. The geotechnical report for the southern skyline ridge trail estimates that the factor of safety for existing slopes would be 1.25 to 1.43 following construction of the retaining walls. A slope is considered unstable if the factor of safety is less than or equal to 1. These values are higher than 1 and equal to or greater than the existing factor of safety before construction of the trail and retaining walls (see Section 4.9.1.2, *Geologic Hazards*, for a description of the existing factor of safety). Therefore, the project would not increase the potential for earthquake-induced landslides or other unstable conditions and would not expose trail users to the hazards of earthquake-induced landslides.

The segments of the southern skyline ridge trail extending along the flatter portions of the proposed trail alignment would be less susceptible to earthquake-induced landslides and other unstable conditions because they would be located in areas mapped by the geological survey as having a low susceptibility to earthquake-induced landslides. The contractor would construct the loop trail on compacted structural fill, which would ensure the trail alignment would not be subject to landslide hazards and would not exacerbate the susceptibility of the existing slopes to earthquake-induced landslides or other unstable conditions. Further, as described in Chapter 2, Project Description (Section 2.5.1, Trail Improvements and Expansions), contractors would appropriate slope the trails to avoid concentrating runoff from the trail surface in a manner that could exacerbate slope instability.

Incorporation of the project features described above, as provided in Chapter 2, Project Description, and in accordance with the recommendations of the geotechnical reports for the project, generally implement and render redundant the requirements of management plan EIR Program-Level Mitigation Measure C.2. With incorporation of these features, impacts related to earthquake-induced landslides and unstable geologic units would be less than significant for the proposed access program and variants.

The SFPUC would not site the project's ancillary features, including access drives, parking areas, and restroom facilities, in areas mapped as prone to landslides. Fencing construction along the Fifield-Cahill ridge trail under variants 2 and 3 would involve only limited excavation to install fence posts. Therefore, project components under the proposed access program and variants would not create or exacerbate hazard risks related to earthquake-induced landslides or unstable geologic units, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to the exposure of people or structures to the risk of loss, injury, or death involving seismic hazards. No mitigation is required.

Impact GE-6: Runoff from the permanent project components would not result in substantial erosion or loss of topsoil during operation. (Less than Significant)

Erosion and loss of topsoil could occur as a result of concentrated runoff from the newly created impervious surfaces, as discussed below.

As discussed in Section 4.10, Hydrology and Water Quality (see Impact HY-1), runoff from the newly created trail surfaces, restroom facilities, and parking lots could cause erosion, either through dispersed *sheet-flow runoff*[54] or through more concentrated runoff that could cause the formation of small erosional channels and larger gullies in the surrounding slopes. This erosion could remove topsoil and also compromise the integrity of the surrounding slopes. The proposed access program and variants would include these facilities, so this impact would be the same regardless of access program type.

The management plan EIR acknowledges that runoff from new trails and facilities could increase soil erosion in the watershed.[55] That EIR's analysis concludes that this geologic impact would be less than significant with implementation of the policies and management activities of the Peninsula Watershed Management Plan, as described in Program-Level Mitigation Measure C.1. These policies and actions call for appropriate design of new features and implementation of erosion control measures.

As discussed in Chapter 2, Project Description (Section 2.5.1, Trail Improvements and Expansions), and in Section 4.10, Hydrology and Water Quality (Impact HY-2), the SFPUC would construct the southern skyline ridge trail and the loop trail with an approximately 1 to 2 percent cross-slope to route water away from the slope. In addition, the project description includes two permanent rock spillways along the southern skyline ridge trail to dissipate trail surface runoff (see Figure 2-3e in Chapter 2, Project Description). For the proposed 20-stall parking lot near the southern skyline ridge trailhead and the 50-stall parking lot south of Cemetery Gate, the SFPUC would install a drain inlet to collect runoff and route it into a nearby vegetated area and would place a small amount of rock (i.e., 20 square feet) at each drain outlet to dissipate runoff energy and prevent erosion.

The proposed design of the southern skyline ridge trail and the loop trail implement the appropriate actions and policies of Program-Level Mitigation C.1, and runoff from the new trail surfaces and parking lots would not cause substantial soil erosion or loss of topsoil. Therefore, this impact would be less than significant for all project features across the proposed access program and variants.

As discussed in Impact HY-2, all of the other new impervious surfaces (e.g., restrooms, retaining walls, and four-stall parking lot) would be relatively small and surrounded by vast areas of vegetated surfaces that would absorb any small amounts of runoff, and/or would have features such as rock dissipaters that would diffuse released runoff and reduce the water's energy. Therefore, because of the size or design of these new features and the surrounding existing physical

54 Sheet flow runoff is when stormwater runoff does not flow in defined channels but rather across broad undefined areas.

55 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.C, Geology and Soils (pp. III.C-7 to III.C-11).

conditions, runoff from these features would not cause substantial soil erosion or loss of topsoil under the proposed access program and variants, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts due to runoff-related erosion or loss of topsoil. No mitigation is required.

Impact GE-7: Use of the trails under the proposed access program and variants would not result in substantial erosion or loss of topsoil during operation. (Less than Significant)

The project improvements would likely elevate the public profile of watershed trails, resulting in more visitors to the Peninsula Watershed, which could increase the potential for unauthorized off-trail watershed entries, as discussed in the management plan EIR and reflected in a recently completed survey of nearby recreational land managers.[56,57] Unauthorized entry could lead to the formation of informal trails extending from the ridgeline to the adjoining valleys, which could increase soil erosion and loss of topsoil if this type of activity became extensive. Additionally, increased public use of the trail and unauthorized entry to other portions of the watershed could increase the chance of fire, which would burn vegetation, expose soil, and lead to erosion and increased sedimentation. This impact analysis addresses the potential for such effects under the proposed access program and variants.

Proposed Access Program (Docent Program on Fifield-Cahill Ridge Trail Components and Unsupervised/Restricted Access on Southern Skyline Ridge Trail)

As explained in Chapter 2, Project Description (Section 2.7.1, Trail Access Management Program and Visitation), total annual visitation under the project is expected to be somewhat less than 50,020 people per year, which represents the upper limit estimated for unsupervised/unrestricted visitation to project trails, as identified in the visitor use study conducted for this EIR analysis.[58] The potential for soil erosion and loss of topsoil would remain low for the Fifield-Cahill ridge trail because trail users would be supervised by a docent and therefore unlikely to create or use unauthorized trails or to engage in behaviors that could start fires. In addition, visitation restrictions would be similar to current access for this trail under the existing docent program.

Under the proposed project, visitation along the southern skyline ridge trail would be unsupervised and restricted to individuals and groups with a permit. As part of this permit program, visitors would be required to complete an educational program that emphasizes visitor

56 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.C, Geology and Soils (pp. V-13 and V-14).
57 ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.
58 CHS, 2018. Memorandum from Jill Hough (CHS) to Elijah Davidian (ESA) re: Travel Demand and VMT Estimates for Southern Skyline Boulevard Ridge Trail Extension. March 22, 2018.

rules and restrictions, including the importance of staying within the designated trails to prevent erosion or disturbance of other areas. As discussed in the management plan EIR,[59] substantial numbers of unsupervised trail users could increase the potential for soil erosion and loss of topsoil from the formation of informal trails as well as an increased risk of fire. The management plan EIR concludes that erosion impacts related to unsupervised access would be less than significant with implementation of the applicable management plan actions, as specified in Program-Level Mitigation Measure C.1. These actions call for minimizing the construction of new trails and restricting access and prohibiting activities likely to cause a fire.

As discussed in Chapter 2, Project Description (Section 2.7.1, Trail Access Management Program and Visitation), under the proposed access program, the SFPUC would install barbed-wire fencing and lockable gates along the southern skyline ridge trail. SFPUC staff would unlock the gates at public access points prior to operational hours and lock them again at closing. Implementation of these security measures would reduce impacts related to soil erosion and loss because the measures would limit public access to established trails that have been designed to accommodate such use and would help prevent unauthorized off-trail access, which could cause the types of effects described above. Construction of the proposed barbed-wire fencing and gates as well as the ongoing monitoring and maintenance program (e.g., daily patrols, weekly facilities inspections, monthly repairs) would meet the general requirements of Program-Level Mitigation Measure C.1. Therefore, project operation under the southern skyline ridge trail would not result in the potential for substantial erosion or loss of topsoil, and any such impact would be less than significant.

Consistent with the management plan EIR impact conclusions,[60] project operation under the proposed access program would not result in substantial soil erosion and loss of topsoil, and impacts would be less than significant.

Mitigation: None required.

Access Program Variant 1 (Docent Program)

Under access program variant 1 (docent program), the potential for soil erosion and loss of topsoil would remain low because trail users would be supervised by a docent and therefore unlikely to create or use unauthorized trails or to engage in behaviors that could start fires. In addition, visitation restrictions would remain similar to those under the existing docent program.

Consistent with the management plan EIR impact conclusions,[61] project operation under access program variant 1 would not result in substantial soil erosion and loss of topsoil, and impacts would be less than significant.

Mitigation: None required.

59 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.C, Geology and Soils (pp. V-13 and V-14).
60 Ibid.
61 Ibid.

Access Program Variant 2 (Unsupervised/Unrestricted Access)

Access program variant 2 would add new trails and remove barriers to access (e.g., reservations and docents), which could result in a substantial increase in visitation. The Fifield-Cahill ridge trail, the loop trail, and the southern skyline ridge trail would be open to unsupervised access by hikers, bicyclists, and equestrians, with up to an estimated 50,020 individuals per year visiting the project area. As discussed in the management plan EIR, and for the reasons presented above, the additional numbers of unsupervised trail users would increase the potential for soil erosion and loss of topsoil from the formation of informal trails and increase the risk of wildfire. The management plan EIR concludes that erosion impacts related to unsupervised access would be less than significant with implementation of the applicable management plan actions, as specified in Program-Level Mitigation Measure C.1. These actions call for minimizing the construction of new trails and restricting access and prohibiting activities likely to cause a fire.

As discussed in Chapter 2, Project Description (Section 2.7.1, Trail Access Management Program and Visitation), under variant 2 the SFPUC would install barbed-wire fencing and lockable gates along the southern skyline ridge trail and Fifield-Cahill ridge trail, encompassing the loop trail. SFPUC staff would unlock gates at public access points prior to operational hours and lock them again at closing. Implementation of these security measures would reduce impacts related to soil erosion and loss because the measures would limit public access to established trails that have been designed to accommodate such use, and they would help prevent unauthorized off-trail access that could cause the types of effects described above. Construction of the proposed barbed-wire fencing and gates as well as the ongoing monitoring and maintenance program (e.g., daily patrols, weekly facilities inspections, monthly repairs) would meet the general requirements of Program-Level Mitigation Measure C.1. Therefore, consistent with the management plan EIR impact conclusions,[62] project operation under access program variant 2 would not result in substantial soil erosion and loss of topsoil, and impacts would be less than significant.

Mitigation: None required.

Access Program Variant 3 (Unsupervised/Restricted Access)

Access program variant 3 would add new trails and remove barriers to access (e.g., reservations and docents), which could result in a substantial increase in visitation. However, given the additional permit requirement, the number of visitors would likely be reduced compared to variant 2. For the same reasons described for the southern skyline ridge trail under the proposed access program (e.g., implementation of project elements that would restrict off-trail visitation and reduce wildfire hazards), variant 3 would have a less-than-significant impact related to substantial erosion or loss of topsoil.

Mitigation: None required.

62 Ibid

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to erosion or loss of topsoil. No mitigation is required.

Cumulative Impacts

Impact C-GE-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on geology, soils, or paleontological resources. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis used throughout this EIR and summarizes the cumulative projects in the vicinity of the project. Although the entire Bay Area is located within a seismically active region with a high risk of seismic hazards and a wide variety of geologic conditions, the geographic scope of cumulative geology and soils impacts is restricted to the project sites and adjacent areas because related risks are relatively localized or even site-specific. The geographic scope for paleontological resources also encompasses the immediate project vicinity.

With the exception of the Pacific Gas and Electric Company (PG&E) Gas Transmission Line project, the sites of all of the cumulative projects listed in Table 4.1-1 are within or adjacent to existing roadways, and would not contribute to cumulative impacts related to erosion, unstable slopes, or the alteration of topography, as discussed in Impacts GE-1, GE-2, GE-3, GE-5, and GE-6. The PG&E Gas Transmission Line project included construction in the Peninsula Watershed that could induce erosion or exacerbate unstable slope conditions. However, this project is subject to the same or similar stormwater permitting and geotechnical requirements as would be required for the trail extension project, and major project construction activities were completed in December 2018. PG&E is now returning the project footprint to its approximate preconstruction condition, after which no substantial erosion, topographic changes, or other site stability issues are anticipated. Therefore, cumulative impacts related to geology and soils would not be significant.

While some of the projects listed in Table 4.1-1 could potentially disturb paleontological resources during construction, the project would not contribute to this cumulative impact because it would not disturb any rock units with a high paleontological sensitivity, as discussed in Impact GE-4. Therefore, cumulative impacts related to paleontological resources would also not be significant.

Mitigation: None required.

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4.10 Hydrology and Water Quality

This section describes the existing hydrologic and water quality environment in the project area and identifies the potential hydrology and water quality impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension project ("project"). The analysis addresses potential effects from construction and operation of the project with the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). The impact discussion addresses the potential for the project to cause exceedances of water quality standards, degrade water quality, and affect stormwater runoff and drainage systems. Section 4.9, Geology, Soils, and Paleontological Resources, discusses erosion issues.

Of the comments received during the public scoping period, comments on the topic of water quality and hydrology were generally about the effects of construction and unsupervised access. The impact analysis presented in Section 4.10.3, Impacts and Mitigation Measures, considers these comments.

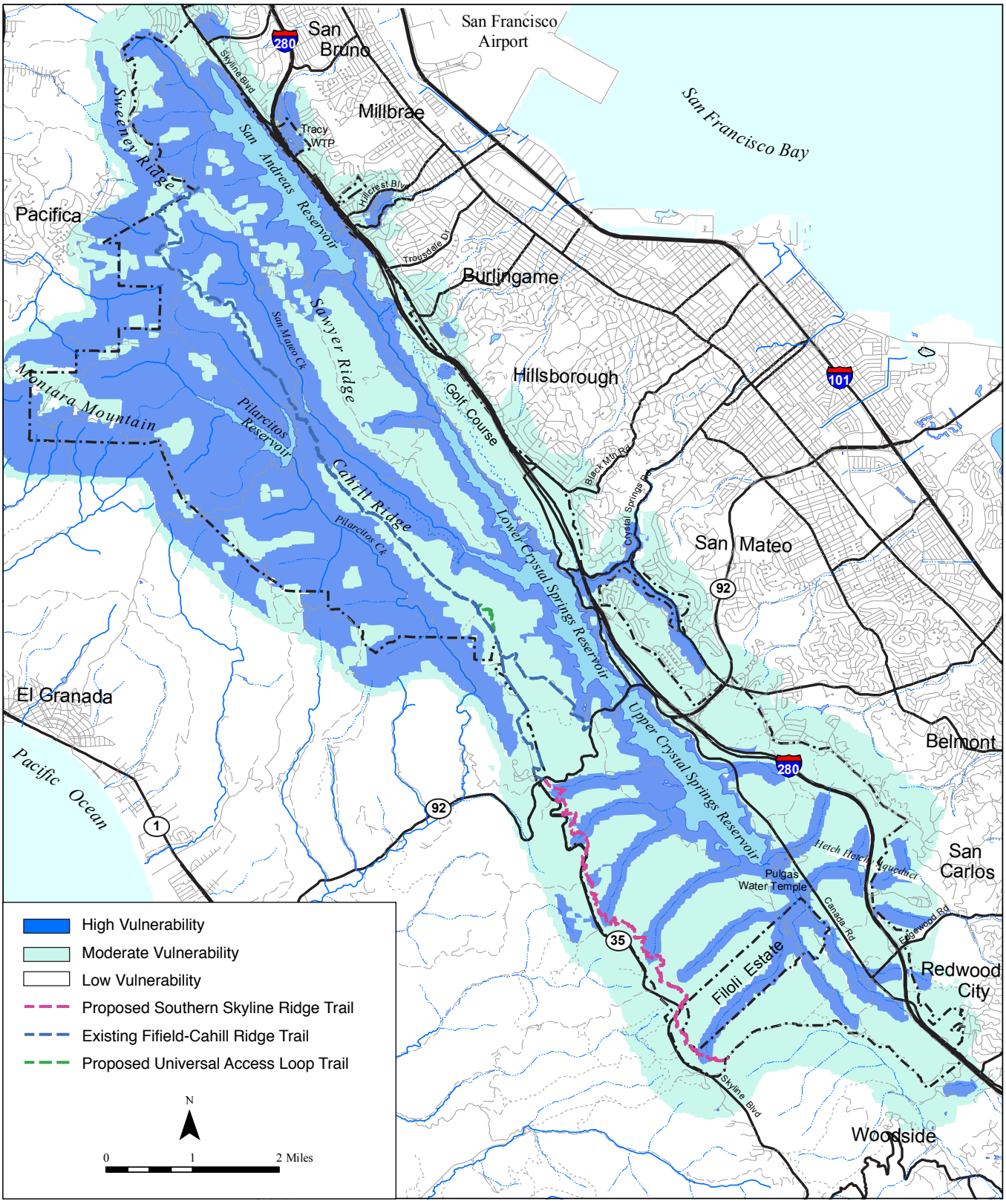
4.10.1 Environmental Setting

This section discusses the drainage areas within the Peninsula Watershed where project components would be located and the water quality of the Upper and Lower Crystal Springs, San Andreas, and Pilarcitos reservoirs, which could all receive runoff from the proposed Fifield-Cahill ridge trail improvement and southern skyline ridge trail areas.[1] The setting described herein lies entirely within the geographic scope of the hydrology and water quality setting characterized in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR). Figure 4.10-1 shows these water features, which are discussed below.

The proposed southern skyline ridge trail and Fifield-Cahill ridge trail improvements would be located along the western border of the Upper and Lower Crystal Springs reservoirs drainage area of the Peninsula Watershed,[2] and also along the western border of the Peninsula Watershed. Runoff from these areas drains to the Upper and Lower Crystal Springs, Pilarcitos, and San Andreas reservoirs, through San Mateo Creek and other minor drainages. Areas west of the Fifield-Cahill ridge trail drain to Pilarcitos Creek which drains to the Pacific Ocean The reservoirs also store treated water from the Alameda Watershed and the SFPUC's Hetch Hetchy system.

1 Stormwater runoff by definition is all precipitation that flows over the ground surface and does not infiltrate into the ground.

2 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (pp. III.D-1 to III.D-3), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.



Southern Skyline Boulevard Ridge Trail Extension

SOURCE: EDAW, Inc., 1998; ESA

Figure 4.10-1

Water Features and Water Quality Vulnerability Zones

On the west side of the Fifield-Cahill Ridge, runoff drains to Pilarcitos Reservoir and Pilarcitos Creek. Pilarcitos Creek originates at the reservoir and flows west, eventually draining to the Pacific Ocean at Half Moon Bay.[3] Some of the water is diverted to the San Andreas and Crystal Springs reservoirs. The Crystal Springs, San Andreas, and Pilarcitos reservoirs provide drinking water to the City and County of San Francisco and other users. Water quality in these reservoirs generally meets water quality standards.[4]

The Peninsula Watershed Management Plan identifies *water quality vulnerability zones*, which are defined as areas where disturbance would have the greatest potential to affect the water quality of surface runoff and water stored in the reservoirs.[5] The management plan classifies vulnerability zones as high, moderate, or low vulnerability based on criteria that assess the proximity to water, intensity of rainfall, wildlife concentration, vegetation as a protective layer, slope, and soil. Disturbance to areas with the highest vulnerability would result in the greatest risk to water quality. The southern skyline ridge trail would cross four areas of high water quality vulnerability,[6] as shown on Figure 4.10-1. The saddle between Fifield Ridge and Cahill Ridge (along the Fifield-Cahill ridge trail, near the Five Points area) is also mapped as an area of high water quality vulnerability. The remainder of the trail alignments and ancillary improvements are located in areas of moderate water quality vulnerability.

4.10.2 Regulatory Framework

4.10.2.1 Federal Regulations

Clean Water Act – Water Quality

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. Environmental Protection Agency (U.S. EPA) the authority to implement pollution control programs. The act sets water quality standards for contaminants in surface waters. The statute employs 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 act, including water quality control planning and programs in California, to the State Water Resources Control Board and the nine Regional Water Quality Control Boards. Water quality standards applicable to the project are listed in the Water Quality Control Plan for the San Francisco Bay Basin, as discussed further below in Section 4.10.2.2, *State Regulations*.

[3] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-3).
[4] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (pp. III.D-4 and III.D-5).
[5] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-5).
[6] Areas of high water quality vulnerability are defined as areas where disturbance would have the greatest potential to affect the water quality of surface runoff and water stored in the reservoirs.

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 act requires regional boards to develop total maximum daily loads (known as T*otal Maximum Daily Loads)* to improve the water quality of impaired water bodies. The San Francisco Bay Regional Water Quality Control Board implements this program in the project area, as discussed below in Section 4.10.2.2, *State Regulations*.

Clean Water Act Section 402

Section 402 of the Clean Water Act authorizes the U.S. EPA to establish a nationwide surface water discharge permit program for all municipal and industrial point sources as well as construction sites that are 1 acre or greater. This program is known as the National Pollutant Discharge Elimination System (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 associated with the project would be subject to elimination system permits, as described below in Section 4.10.2.2, *State Regulations*.

4.10.2.2 State Regulations

California Porter-Cologne Water Quality Control Act

As described in the management plan EIR, the purpose of the Porter-Cologne Water Quality Control Act (division 7 of the California Water Code) is to protect water resources of the State such that they be put to beneficial uses for residents and visitors of California. Nine regional boards administer the water quality control program, with oversight from the state board. The project lies within the jurisdiction of the San Francisco Bay regional board.

San Francisco Bay Water Quality Control Plan

As described in the management plan EIR, the regional board established regulatory standards and objectives for water quality within the San Francisco Bay region through its Water Quality Control Plan for the San Francisco Bay Basin,[7] commonly referred to as the Basin Plan.[8] The Basin Plan identifies existing and potential beneficial uses for surface and ground waters and provides numerical and narrative water quality objectives designed to protect those uses. Table 4.10-1 summarizes the identified beneficial uses for Upper and Lower Crystal Springs, San Andreas, and Pilarcitos reservoirs as well as Pilarcitos and San Mateo creeks. Water contact recreation activities are prohibited in the reservoirs to protect public health, but the Basin Plan water quality objectives for water contact recreation beneficial uses still apply to the reservoirs.

7 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-5).

8 San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Region, San Francisco Bay Basin (Region 2), *Water Quality Control Plan (Basin Plan),* May 4, 2017, https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html#basinplan, accessed April 29, 2019.

TABLE 4.10-1
DESIGNATED BENEFICIAL USES

Water Body	Designated Beneficial Uses
Upper Crystal Springs Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Lower Crystal Springs Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Pilarcitos Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
San Andreas Reservoir	MUN, COLD, RARE, SPWN, WARM, WILD, REC-1,* REC-2
Pilarcitos Creek	AGR, MUN, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2
San Mateo Creek	FRSH, COLD, MIGR, RARE, SPWN, WARM, WILD, REC-1, REC-2

Beneficial Uses Key:

AGR (Agricultural Supply)
MUN (Municipal and Domestic Supply)
FRSH (Freshwater Replenishment)
COLD (Cold Freshwater Habitat)
MIGR (Fish Migration)
RARE (Preservation of Rare and Endangered Species)
SPWN (Fish Spawning)
WARM (Warm Water Freshwater Habitat)
WILD (Wildlife Habitat)
REC-1 (Body Contact Recreation)
REC-2 (Noncontact Recreation)

* = Water contact recreation activities are prohibited in the reservoirs to protect public health, but the Basin Plan water quality objectives for water contact recreation still apply.

SOURCE: San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Region, San Francisco Bay Basin (Region 2), *Water Quality Control Plan (Basin Plan),* May 4, 2017, https://www.waterboards.ca.gov/sanfranciscobay/basin_planning.html#basinplan, accessed April 29, 2019.

National Pollutant Discharge Elimination System Waste Discharge Regulations

As discussed in Section 4.10.2.1, *Federal Regulations*, section 402 of the Clean Water Act established the NPDES program to protect the water quality of receiving waters. This program requires all construction sites on 1 acre or greater of land and 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 discharges of pollutants for the protection of water quality. The technology limits are based on the ability of dischargers in the same category to treat wastewater, whereas discharges must follow water-quality-based limits 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. In California, the state board and the regional boards implement and enforce the NPDES program.

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

Stormwater discharges associated with construction activities that disturb more than 1 acre of land are subject to the state board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ (construction general permit). Construction activities subject to this permit include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. The construction general permit calls for best management practices to

prevent pollutants from contacting stormwater and to keep all products of erosion and stormwater pollutants from moving off site into receiving waters. The pollution control measures for a given project are based on potential water quality impacts and specified in a stormwater pollution prevention plan, which a qualified stormwater pollution prevention plan developer must prepare and submit to the San Francisco Bay regional board prior to beginning construction.

Under the construction general permit, the stormwater prevention plan developer characterizes the project's risk level to water quality, which is determined by considering a combination of the sediment risk of the project and the receiving water quality risk. Projects are characterized as levels 1, 2, or 3, and the minimum pollution control measures and monitoring the project must implement during construction are based on the risk level. 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 a project would depend on when the project is implemented and would have a higher sediment risk if it were implemented during the rainy 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 is listed 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.

The SFPUC would conduct all of the proposed construction activities along the southern skyline ridge trail alignment and the Fifield-Cahill ridge trail, which are located in the watersheds of the Upper and Lower Crystal Springs and San Andreas reservoirs.[9] These reservoirs are not considered sediment-sensitive water bodies under the construction general permit because they are not listed as impaired for sediment[10] and do not have all three beneficial uses of cold freshwater habitat, fish migration, and fish spawning.

Municipal Regional Stormwater Permit (State Water Resources Control Board Order No. R2-2015-0049)

The municipal regional stormwater permit issued by the regional board (Order No. R2-2015-0049) addresses stormwater runoff from development projects in San Mateo County as well as three other counties and two cities. Provision C.3 of this permit requires development projects to address pollutants in stormwater runoff and to prevent increases in runoff flows from new development and redevelopment projects. To accomplish this, parking lots that create 5,000 square feet or more of impervious surfaces must incorporate low-impact design features, such as source control and stormwater treatment measures, into their project design. Therefore, because the proposed 20-vehicle parking lot could have impervious surfaces greater than 5,000 square feet, the municipal regional stormwater permit would apply (the 50-vehicle parking lot would fall under California Department of Transportation requirements, as discussed below). Trails that are more than 10 feet wide and certain road projects that create 10,000 square feet or more of impervious area

[9] The proposed restroom and parking area are located outside of the watershed and drain to Pilarcitos Creek well south of the Pilarcitos Reservoir.

[10] State Water Resources Control Board, *TMDL - The Integrated Report, 303(d) List of Water Quality Limited Segments, Region 2, Lower Crystal Springs Reservoir*, https://www.waterboards.ca.gov/rwqcb5/water_issues/tmdl/impaired_waters_list/, accessed April 17, 2019.

must also incorporate low-impact design features. For projects that do not meet these thresholds, the permit encourages municipalities to enforce similar requirements.

Caltrans Statewide Stormwater Permit (State Water Resources Control Board Order 2012-0011-DWQ)

Stormwater discharges from California Department of Transportation (Caltrans) properties, facilities, and activities are subject to the state board NPDES Statewide Stormwater Permit, Waste Discharge Requirements for State of California Department of Transportation, Order No. 2012-0110-DWQ, as amended by Order WQ 2014-0006-EXEC, Order WQ 2014-0077-DWQ, and Order WQ 2015-0036-EXEC (the Caltrans statewide stormwater permit). This permit specifies post-construction stormwater treatment requirements for highway facilities that add 1 or more acre of impervious surfaces and for non-highway facilities, such as parking lots, that add 5,000 square feet or more of impervious surfaces. Therefore, because the project proposes development in the Caltrans right-of-way and involves the creation of more than 5,000 square feet of new impervious surfaces, the Caltrans statewide stormwater permit may apply. For these projects, the permit prioritizes infiltration, reuse, and *evapotranspiration*[11] for the management of stormwater runoff. If these management approaches are not feasible, the permit requires capture and treatment of runoff by low-impact, design-based, flow-through treatment devices or conventional volume-based or flow-based stormwater treatment devices. Construction-related discharges of stormwater from Caltrans properties are regulated under the construction general permit described above.

Caltrans Statewide Stormwater Management Plan

The Caltrans Statewide Stormwater Management Plan, dated July 2016, describes the programs, procedures, and practices used by Caltrans to reduce or eliminate the discharge of pollutants to storm drain systems under the Caltrans statewide stormwater permit and the construction general permit. It specifies procedures for monitoring and characterizing stormwater and non-stormwater discharges; selecting and implementing stormwater best management practices; planning and designing projects (including determining the need for *hydromodification*[12]); controlling the discharge of stormwater pollutants from construction sites; controlling the discharge of stormwater pollutants from maintenance and operational activities; and controlling non-stormwater discharges such as accidental spills. For construction sites, the plan requires preparation of a stormwater pollution prevention plan and compliance with other requirements of the construction general permit. Caltrans reviews and authorizes stormwater plans for construction projects under its jurisdiction, and also conducts stormwater inspections on construction sites to ensure that site pollution control measures are properly maintained and functional. The construction contractor's compliance with Statewide Stormwater Management Plan is ensured through the construction contract, as enforced by Caltrans staff. Project elements

11 Evapotranspiration is the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces.

12 Hydromodification is the alteration of the natural flow of water through a landscape, and can take the form of changes to groundwater infiltration, channel modification or channelization.

sited within the Caltrans right-of-way and subject to the Caltrans statewide stormwater permit must be designed in accordance with the Caltrans Statewide Stormwater Management Plan.

Caltrans Highway Design Manual

The Caltrans Highway Design Manual contains policies, procedures, and standards for the design of features that are part of the California state highway system. Under the project, the SFPUC would construct the parking lot at the northern trailhead of the southern skyline ridge trail and the proposed access drives within the Caltrans right-of-way; therefore, the design of these features, including facilities to manage drainage from the parking lot, would be subject to the Caltrans requirements. Section 800 of the manual includes information for the design of drainage systems, and chapter 890 provides requirements for stormwater management. This chapter specifies that stormwater management systems be designed to avoid downstream erosional effects and that the systems be adequately maintained.

4.10.2.3 Local Regulations

The hydrologic resources policies of the Peninsula Watershed Management Plan that would apply to this project include:

Policy WQ1: Prevent the introduction of pesticides and chemicals into the water supply by minimizing and controlling the use of these constituents, and implementing alternative methods for pest control, where feasible, and by controlling chemical use and requiring that nontoxic, non-persistent alternatives be used where practical.

Policy WQ2: Restrict aerial broadcast spraying of chemical pesticides as a means of vegetation management and pest control. Ultra-low-volume aerial spraying of *biorational* controls such as *Bacillus thuringiensis israelensis* (a bacterium) and *Lagenidium giganteum* (fungal parasite), which are host-specific agents (affecting mosquito larvae), may be allowed if consistent with the City and County of San Francisco Pesticide Ordinance (No. 274-97) and the SFPUC Integrated Pest Management Plan since they do not have the side effects of persistence, accumulation, and non-selective mortality associated with chemical pesticides.

Policy WQ7: Prevent the potential for hazardous materials spills into the water supply by controlling their use and transport within the watershed.

Policy WQ14: Minimize, and where possible prohibit, land uses and activities that have the potential to cause erosion, sediment generation, and stormwater runoff.

Policy WQ15: Where suitable, use sedimentation basins to control the effects of erosion and sediment transport.

Policy WQ25: Wherever possible, preserve and protect stream channels and banks to protect water quality by maintaining or improving channel stability and reducing bank erosion.

4.10.3 Impacts and Mitigation Measures

4.10.3.1 Significance Thresholds

The project would have a significant impact related to hydrology and water quality if it were to:

- 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 that 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 site or off site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on site or off site;
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- 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.

Because of the location and nature of the project and for the reasons described below, there would be no impacts related to the following significance criteria; therefore, these criteria are not discussed further.

- ***Substantially deplete groundwater supplies or interfere with groundwater recharge.*** The project would not withdraw groundwater for any reason during either construction or operation. The proposed 20-vehicle parking lot at the trailhead of the southern skyline ridge trail would create approximately 27,450 square feet of new impervious surfaces; the proposed 50-vehicle parking lot south of Cemetery Gate would create approximately 40,000 square feet of new impervious surfaces; the universal access loop trail and parking area north of Cemetery Gate would create approximately 32,650 square feet of new impervious surfaces; the retaining walls and associated spillways would create 7,010 square feet of impervious surfaces; and the bathrooms would create approximately 384 square feet of impervious surfaces.

These new impervious surfaces would total approximately 107,500 square feet, or 2.5 acres. They would locally restrict the infiltration of rainwater, which could recharge groundwater under undisturbed conditions. However, the new impervious areas would not substantially interfere with groundwater recharge because all rainwater falling on the new impervious surface would run off to the adjacent unpaved areas and infiltrate into the subsurface, and the total impervious area would constitute an infinitesimally small portion of the 23,000-acre Peninsula Watershed.

- ***Exceed the capacity of existing or planned stormwater drainage systems, or provide substantial additional sources of polluted runoff during construction.*** There are no stormwater systems within the project area; therefore, runoff during project construction would not exceed the capacity of an existing or planned storm drainage system or provide an additional source of stormwater pollutants to such a system. There would be no construction impacts related to this topic. Impact HY-2 discusses the operational impacts related to this topic.

- ***Impede or redirect 100-year flood flows or place housing within a 100-year flood hazard area as mapped on a federal flood hazard boundary or flood insurance rate map.*** The project site is not located in a *100-year flood zone*[13,14] and would not involve the construction of housing. Therefore, there would be no impact related to these topics during construction or operation.

- ***Expose people or structures to a significant risk of loss, injury, or death involving flooding due to failure of a levee or failure of a dam.*** All of the project components would be located along ridgelines, at elevations of approximately 880 feet above sea level or higher—well above the existing reservoirs of the area including San Andreas, Pilarcitos, and Lower Crystal Springs and Upper Crystal Springs reservoirs. Neither of the proposed trail alignments nor any of the proposed improvements would be located within a dam inundation area.[15] Therefore, there would be no impact related to this topic during construction or operation.

- ***Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow.*** The project components would be located along ridgelines, at **e**levations of approximately 880 feet above sea level or higher, more than 5 miles inland from the Pacific Ocean coast. Therefore, the proposed trail and associated improvements would not be subject to potential inundation by coastal hazards such as tsunamis, extreme high tides, or sea-level rise. The project could include fencing and increase visitation along the Fifield-Cahill ridge trail, portions of which are within 500 feet of Pilarcitos Reservoir. However, the trail and improvements areas are more than 100 feet higher in elevation than the reservoir and its associated its associated drainage, Pilarcitos Creek. Thus, project improvements and visitation along the trail would be above and upstream of any seismic event generating seiche or mudflow. Therefore, there would be no impact related to this topic during construction or operation.

13 Federal Emergency Management Agency, *FEMA Flood Map Service Center: Search by Address*, *https://msc.fema.gov/portal/search?AddressQuery=10600%20Skyline%20Boulevard%2C%20San%20Mateo%2C%20Ca#searchresultsanchor*, accessed December 27, 2016.

14 The 100-year flood zone is the area mapped as being susceptible to flooding with a once percent chance of occurring annually.

15 County of San Mateo Planning and Building Department, *Dam Failure Inundation Areas – San Mateo County*, 2005, *http://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/Dam_Failure_Inundation.pdf*, accessed December 27, 2016.

4.10.3.2 Approach to Analysis

Project Impacts

This analysis evaluates the project's potential construction and operational effects related to hydrology and water quality.

Construction Impacts

Construction-related effects on hydrology and water quality are direct or indirect impacts that could occur during construction, including excavation and earthmoving activities. The impact analyses below demonstrate that compliance with regulatory requirements for these activities would ensure that water quality-related impacts remain less than significant during construction.

Operational Impacts

Operational impacts are those associated with long-term operation of the proposed trails, parking lots, and ancillary features, including potential changes in stormwater runoff and alteration of drainage patterns. Impacts related to changes in stormwater runoff are considered significant if project-related runoff would cause substantial erosion and related water quality effects, exceed the capacity of the planned stormwater infrastructure, or provide a substantial additional source of stormwater pollutants. Impacts related to the alteration of drainage patterns would be significant if they would cause substantial erosion, siltation, or flooding within the project area or off site.

The management plan EIR also evaluates impacts related to the contamination of a public water supply.[16] Impacts HY-1 and HY-2 address these impacts, in addition to compliance with water quality criteria and degradation of water quality during construction and operation.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of the potential cumulative projects near the project area. The cumulative analysis related to hydrology and water quality 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. Similar to the analysis for project impacts, the cumulative impact analysis assumes that the other projects in the immediate vicinity would also be constructed and operated in compliance with design standards as well as stormwater permitting requirements, which would serve to avoid and reduce most if not all impacts to less-than-significant levels on a project-by-project basis. The cumulative analysis considers whether there would be a significant, adverse cumulative impact associated with the effects of project implementation in combination with the effects of proximate 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

16 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-11); Section V.D, Hydrology and Water Quality (pp. V-15 and V-16).

contribution to cumulative effects to be deemed cumulatively considerable (significant). If effects are deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.10.3.3 Impact Summary

Table 4.10-2 summarizes the impacts of the project related to hydrology and water quality. The impact summary table provides separate significance determinations for the proposed access program, variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access).

TABLE 4.10-2
SUMMARY OF IMPACTS – HYDROLOGY AND WATER QUALITY

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact HY-1: Construction of the project would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, or alter existing drainage patterns.	LS	LS	LS	LS
Impact HY-2: Stormwater runoff from permanent project components would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	LS	LS	LS	LS
Impact HY-3: Use of the trails under the proposed access program and variants would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns.	LS	LS	LS	LS
Impact C-HY-1: The project, in combination with past, present, and probable future projects in the site vicinity, would not result in significant adverse cumulative hydrology impacts.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required

4.10.3.4 Impact Analysis

Construction Impacts

Impact HY-1: Construction of the project would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, or alter existing drainage patterns. (Less than Significant)

Erosion and Use of Hazardous Materials

Clearing, grubbing, grading, and earthmoving for construction of project components (e.g., staging areas, trails, parking areas, access drives, fencing, and restrooms) would expose soil during construction. These activities could result in soil erosion, with excess sediment carried in stormwater runoff. Stormwater runoff from temporary on-site use and storage of vehicles, fuels, wastes, and building materials during construction could also carry pollutants if these materials were improperly handled or stored.

The management plan EIR concludes that construction activities typically involve grading and other earthmoving activities that could lead to excess erosion and sedimentation,[17] and that this water quality effect would be less than significant with implementation of Program-Level Mitigation Measure D.2. This mitigation measure calls for implementation of the relevant management plan policies and management actions, such as those requiring a grading plan, erosion control, and related measures.[18] The policies and management actions of the management plan referenced in Program-Level Mitigation Measure D.2 are designed to protect water quality in a manner that is now accomplished through compliance with the regulations discussed in Section 4.10.2, Regulatory Framework, above. Therefore, compliance with existing mandatory regulatory requirements fulfills the intent of Program-Level Mitigation Measure D.2, and no mitigation is necessary.

As described in Chapter 2, Project Description, of this EIR, construction would take place over a 12-month period, with earthwork in proximity to any of the drainages occurring during all seasons. The proposed construction activities would involve disturbance of more than 1 acre of land and would be subject to the requirements of the NPDES construction general permit and applicable Caltrans requirements. The specific requirements of the permit would be based on the level of risk to water quality, which would consider the project's sediment risk and the receiving water quality risk. Depending on the degree of risk, the project components would be characterized by the contractor according to the NPDES construction general permit as risk level 1, 2, or 3, and the construction contractor must implement minimum best management practices and monitoring based on the corresponding risk level.

The pollution and erosion control measures for the project would be designed to prevent pollutants from coming into contact with stormwater and to keep all products of erosion and

[17] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (pp. III.D-4 to III.D-17).

[18] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.D, Hydrology and Water Quality (p. IV-2).

stormwater pollutants from moving off site into receiving waters. A qualified stormwater pollution prevention plan developer would prepare a stormwater pollution prevention plan and submit it to the regional water board before construction begins. Construction activities under the project would not likely be characterized as risk level 3 (highest risk to water quality). This is because the creeks (San Mateo and Pilarcitos) and reservoirs (Upper and Lower Crystal Springs, Pilarcitos, San Andreas) that drain the project area are not considered sediment-sensitive water bodies under the construction general permit, and the sediment risk (based on site location, construction work window, and amount of vegetation on and near work areas) would likely be relatively low.

For construction activities characterized as risk level 1 (low sediment risk and low receiving water risk), the construction general permit requires the project proponent to implement minimum best management practices 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. A qualified professional must inspect the required management practices weekly when there is no rain and daily during a qualifying rainstorm. For construction activities characterized as risk level 2, the contractor must implement the minimum requirements identified for risk level 1 in addition to some more stringent requirements (e.g., erosion controls in conjunction with sediment controls in active construction areas, and linear sediment controls such as silt fences, gravel bag berms, or fiber rolls along slopes). In addition, a qualified stormwater plan 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 activities that would occur at the site during all construction phases. The plan would include suggested actions for each construction activity.

Examples of housekeeping practices that would likely be included in the project's stormwater plan for equipment fueling and servicing are as follows:

- Locate equipment maintenance and fueling areas for mobile equipment at least 200 feet from stream channels, wetlands, or other aquatic sites.
- Service mobile equipment in designated areas, away from sensitive species or habitats.
- Inspect motorized construction equipment daily for oil, fuel, and coolant leaks prior to initiating work.
- Prohibit the use of any equipment found to be leaking fluids in or within 200 feet of aquatic habitat features.
- Place oil catchment mats under vehicles parked overnight on the work site.
- Provide spill prevention and response.

Examples of erosion control measures that would likely be included in the project's stormwater plan are as follows:[19]

- Create a positive gradient away from slopes when construction is stopped to carry stormwater runoff away from the slopes to areas where erosion and sediment can be controlled.
- Provide erosion protection on all exposed surfaces of cut-and-fill slopes when grading is completed, using methods such as seeding, preferably with deep-rooted native plants; do not leave graded slopes exposed through a winter season without the completion of erosion control measures and/or slope planting.
- Protect slopes from erosion during the wet season (typically October through April), either by rolling them smooth and placement of erosion fabric or by protecting them from infiltration.
- Maintain all landscaped slopes in a vegetated state after project completion with drought-tolerant vegetation that requires infrequent drip irrigation during summer; do not use any pressurized irrigation lines on or near the tops of graded slopes.

Compliance with the construction general permit, including implementation of pollution and erosion control practices such as those listed above, and required inspection and monitoring would prevent stormwater runoff during project construction from violating water quality standards or degrading water quality. The management practices implemented during construction in accordance with the required stormwater pollution prevention plan would similarly reduce the likelihood that stormwater runoff from the construction site would result in substantial offsite erosion or siltation. Permit compliance would likely protect against construction-related alteration of drainage patterns that could cause offsite erosion, siltation, or flooding. Therefore, project construction under the proposed access program and variants would not violate water quality standards or waste discharge requirements, substantially degrade water quality, or alter existing drainage patterns, and impacts would be less than significant.

Wetlands and Drainage Features

As described in Chapter 2, Project Description, Section 2.6.5, Avoidance of Wetlands and Bridge Installation, the SFPUC would construct the project to avoid three small wetland and/or drainage features along the southern skyline ridge trail corridor and one along the universal access loop trail corridor.

Near the southern skyline ridge trail and universal access loop trail alignments, the project could have an inadvertent but substantial adverse impact through direct and/or indirect construction effects on nearby wetlands (e.g., driving through, working in, discharging into, filling), which would be significant. However, as noted in the above-referenced section of Chapter 2, Project Description, the SFPUC would conduct a preconstruction survey to determine the exact extent of the wetland boundaries at time of construction; erect fencing and signage along the portions of the wetlands adjacent to work areas to prevent encroachment into the wetlands; install water

[19] AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

quality management practices, such as fiber rolls and silt fences, around the work areas; increase the frequency of environmental inspection and monitoring; provide construction personnel training; and use smaller equipment and hand tools for near-wetland trail construction. The construction contract for the proposed fencing would require the contractor to use hand tools and minimize soil disturbance. These measures would apply to the placement of line posts at 50-foot intervals and T-posts at 10-foot intervals through the wetland, as shown on Figure 2-3c. The project's bid specifications would include these specialized measures, which would be made a requirement of the construction contract. With implementation of these construction measures and adherence to NPDES construction general permit requirements, as proposed, construction would avoid the wetlands or drainage features as much as possible and would minimize any disturbance associated with the installation of the fence posts within the wetlands. As a result, runoff from the construction site would also not adversely affect these features. Therefore, project construction under the proposed access program and variants would not result in substantial adverse water quality effects related to wetlands and drainage features, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Construction of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to violations of water quality standards and waste discharge requirements, or the alteration of existing drainage patterns. No mitigation is required.

Operational Impacts

Impact HY-2: Stormwater runoff from permanent project components would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns. (Less than Significant)

Once the project is constructed, runoff from permanent project components that create impervious surfaces (e.g., trail surfaces and retaining walls, parking areas, restrooms) could potentially cause erosion and subsequent water quality degradation if not properly managed. Increased erosion could subsequently affect water quality in the Upper and Lower Crystal Springs reservoirs and/or Pilarcitos Creek through siltation. These impacts are discussed below.

The management plan EIR concludes that the development of new facilities in the watershed could increase the area of impervious surfaces, as well as introduce manmade chemicals and other materials to the watershed that could in turn enter stormwater runoff and affect the quality of receiving waters.[20] As analyzed in the management plan EIR, this impact would be less than

[20] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-14).

significant with implementation of Program-level Mitigation Measure D.2. This mitigation measure calls for implementation of relevant management plan policies and management actions, such as requirements for roads and land uses in the watershed that could cause sedimentation or create new impervious surfaces. The policies and management actions referenced in Program-Level Mitigation Measure D.2 are designed to protect water quality in a manner that is now accomplished through compliance with current storm drainage NPDES permit regulations. The Caltrans statewide permit and the municipal regional permit both include requirements that new impervious surfaces incorporate stormwater flow and treatment controls into the project design. Therefore, compliance with mandatory regulatory requirements fulfills the intent of Program-Level Mitigation Measure D.2, and no mitigation is necessary.

The management plan EIR also concludes that the development of new parking areas could result in potentially significant water quality impacts from increased runoff, excess sedimentation, and introduction of chemicals and other materials.[21] As analyzed in the management plan EIR, this impact would be less than significant with implementation of Project-Level Mitigation Measure D.1 for the Fifield-Cahill ridge trail, which requires that the project incorporate onsite stormwater treatment and/or controls to reduce stormwater runoff from the parking lots to the watershed.[22] As stated above, compliance with existing NPDES stormwater requirements fulfills the intent of Mitigation Measure D.1 and would reduce potential water quality impacts from increased runoff on the proposed parking areas to less-than-significant levels, and no mitigation is necessary.

Runoff from Southern Skyline Ridge Trail

While the proposed southern skyline ridge trail would not create new impervious surfaces, runoff from the new trail could cause erosion and subsequent water quality degradation by concentrating runoff from the trail surface and changing runoff patterns in the vicinity of the trail. In addition, trail users could increase erosion by way of potential pedestrian, equestrian, and bicycle-traffic within seasonal drainages.

No specific regulatory requirements apply to the management of stormwater runoff from the southern skyline ridge trail during project operation.[23] However, as discussed in Chapter 2, Project Description, Section 2.5.1, Trail Improvements and Expansions, SFPUC designed the new trail to follow existing grades and ground topography and to have a maximum grade of 10 percent, which would minimize the disruption of stormwater runoff patterns in the trail vicinity. The SFPUC would surface the 6-foot-wide trail with crushed aggregate, some of which would be sealed with a natural resin, and would construct the trail surface with a 1 to 2 percent cross-slope, which would minimize the potential for erosion of the trail surface and for concentrating runoff

21 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.D, Hydrology and Water Quality (p. V-16).

22 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.D, Hydrology and Water Quality (p. VI-2).

23 As stated in Chapter 2, Project Description, portions of the southern skyline ridge trail may be sealed with a natural resin (see Section 2.5.1, Trail Improvements and Expansions), which could create impervious areas. However, these resin surfaces would not be subject to the municipal regional stormwater permit because the trail would be 6 feet wide. The stormwater permit includes regulatory requirements for trails that are more than 10 feet wide.

in a manner that would cause erosion of the surrounding soil. The project would include two permanent rock spillways at separate locations near the trail's southern terminus to dissipate surface runoff (see Figure 2-3e). In the vicinity of the southernmost wetland identified along this trail alignment, the SFPUC modified the trail plan to remove a segment of the trail that would have bisected an approximately 2-foot-wide depression through which water from a culvert beneath S.R. 35 drains seasonally (see Figure 2-3d). In this location, work crews would construct the trail to a setback distance of approximately 5 feet on either side of the seasonal drainage. There would be no trail improvements within the seasonal drainage and the setback area; however, visitors would be allowed to traverse the unimproved area, which could cause disturbances to soils and potential siltation when water is present in the drainage. However, because the drainage is seasonal and is located a considerable distance (approximately 1 mile) from any receiving waters, the potential impact would be less than significant.

As part of routine facilities maintenance similar to that performed for other watershed facilities, the SFPUC would implement an annual maintenance program in accordance with the Peninsula Watershed Management Plan. Typical maintenance activities would include periodic (e.g., monthly) inspection of trail infrastructure (e.g., trail and parking lot surfaces, retaining structures, vegetation management and drainage facilities), with more frequent inspection of restroom and security facilities (i.e., daily or weekly, as needed). As is common practice in the watershed, the extent and frequency of inspections would increase further during the rainy season, including daily following storm events.[24] Additional watershed maintenance activities would occur with implementation of the project (see Section 2.7.2, Trail and Facilities Operations and Maintenance).

Design of the southern skyline ridge trail, as discussed above, would avoid erosion and associated sedimentation as a result of stormwater runoff. Incorporation of the proposed design, including two rock spillways to dissipate surface runoff, would reduce the potential for the trail to alter drainage patterns in a manner that would cause erosion, siltation, or flooding. Further, the project would not cause impacts related to exceeding the capacity of a stormwater drainage system or providing additional sources of stormwater pollutants, because no stormwater drainage system exists or is planned in the vicinity of the proposed southern skyline ridge trail alignment. The proposed southern skyline ridge trail alignment, through compliance with mandatory regulatory requirements, would fulfill the intent of management plan EIR Program-Level Mitigation Measure D.2. Therefore, operation of the southern skyline ridge trail under the access management program and variants would not result in substantial adverse stormwater runoff, and this impact would be less than significant. No mitigation is necessary.

Runoff from Southern Skyline Ridge Trail Parking Lot

The proposed 20-vehicle parking lot at the trailhead for the southern skyline ridge trail, which would be located within the Caltrans right-of-way, would create approximately 27,500 square feet of new impervious surfaces. Because the new impervious surface area would be greater than 5,000 square feet, the parking area would be subject to the Caltrans statewide stormwater permit described above in Section 4.10.2.2, *State Regulations*. In accordance with the requirements of this

[24] ESA+Orion, *Southern Skyline Boulevard Ridge Trail Extension Project, Meeting/Conference Call Summary*, May 30, 2018.

permit, and as discussed in Chapter 2, Project Description, of this EIR, the SFPUC would install a drain inlet in the parking lot to collect and route surface runoff into a nearby vegetated area and would place a small amount of rock (i.e., 20 square feet) at the drain outlet to prevent erosion. The SFPUC would design the stormwater drainage system and controls required by the Caltrans statewide stormwater permit in accordance with section 800 of the Caltrans Highway Design Manual, which would ensure that these facilities are sized to avoid downstream erosion and are adequately maintained. While the additional parking in this area could provide an additional source of stormwater pollutants, incorporation of the vegetated area would allow the stormwater to infiltrate through the soil and prevent the offsite transport of stormwater pollutants. With implementation of these stormwater controls as part of the project, in accordance with the requirements of the Caltrans statewide stormwater permit as well as the municipal regional permit, as applicable, stormwater runoff from the parking area would not induce erosion, exceed the capacity of the storm drain system, or provide an additional source of stormwater pollutants. The project design and stormwater permit requirements fulfill the requirements of management plan EIR Project-Level Mitigation Measure D.1, which requires that parking lot designs incorporate onsite stormwater treatment and/or controls to reduce stormwater runoff. Therefore, operation of the southern skyline ridge trail parking lot under the proposed access program and variants would not result in substantial adverse stormwater runoff, and this impact would be less than significant. No mitigation is necessary.

Runoff from the Universal Access Loop Trail, Accessible Parking, Retaining Walls, and Bathrooms

The design of the new 10-foot-wide loop trail at the Fifield-Cahill ridge trail calls for surfacing with a mixture of native material and natural resin, which would be impervious. This 0.5-mile-long trail would create approximately 27,000 square feet of new impervious surfaces. Because the loop trail would not be greater than 10 feet wide, it would not be subject to the requirements of the municipal regional stormwater permit described above in Section 4.10.2.2, *State Regulations*. However, similar to the southern skyline ridge trail, the trail would be constructed with a 1 to 2 percent cross-slope, which would minimize the potential for concentrating runoff so that it would not cause erosion of the surrounding soil. Therefore, considering the characteristics of the proposed loop trail—including the relatively narrow strip of impervious surfaces with little topographic change—runoff from the trail would not be concentrated and would easily absorb into the surrounding open space.

The requirements of the municipal stormwater permit would not apply to the design and operation of the universal access loop trail parking lot or bathrooms because each would involve the creation of less than 10,000 square feet of impervious surfaces. The municipal stormwater permit requirements also would not apply to the new retaining walls (at separate locations along the northern extent of the southern skyline ridge trail and near the middle of the proposed trail) because they would create less than 10,000 square feet of impervious surfaces. In addition to their small size, the retaining walls would be designed to facilitate drainage from behind the walls, with rock spillways or other features provided to dissipate the runoff, as described in this EIR in Chapter 2, Project Description, Section 2.5.1.1, *Southern Skyline Boulevard Ridge Trail Extension*.

Consequently, stormwater runoff from these structures would not induce erosion, sedimentation, or flooding.

The relatively narrow and flat loop trail design, as presented above, would not result in erosion and associated sedimentation and would not result in flooding as a result of stormwater runoff, because any runoff from this trail would be evenly distributed. By preventing erosion and sedimentation, the proposed design would fulfill the requirements of management plan EIR Program-Level Mitigation Measure D.2. The project's relatively small impervious areas would not generate substantial runoff that could cause erosion, siltation, or flooding, given the amount of and even distribution runoff they would produce, coupled with the topographic conditions. Further, the retaining walls would be designed to funnel any excess water into constructed drainage features with rock spillways or dissipation areas, as necessary. Therefore, operation of these new impervious surfaces under the proposed access program and variants would not result in degradation of water quality or alteration of drainage patterns, and this impact would be less than significant. No mitigation is necessary.

Runoff from Fifield-Cahill Ridge Trail Parking Lot

The new parking lot proposed as part of the Fifield-Cahill ridge trail improvements would occupy approximately 40,000 square feet. The SFPUC would construct the parking lot using a firm, stable, and slip-resistant base to meet Americans with Disabilities Act requirements and would surface the lot with asphalt or pervious concrete. This analysis conservatively assumes that the entire lot would be impervious. The associated uses of the parking lot could introduce minor amounts of new stormwater pollutants such as oil, grease, and metals that could cause downstream water quality degradation. However, because the amount of impervious surfaces would exceed 5,000 square feet, the parking lot design would be required to adhere to the municipal regional permit. These NPDES drainage control requirements would include both water quality and flow treatment control design features. Therefore, operation of the parking lot proposed near the Fifield-Cahill ridge trail would not result in runoff that would cause substantial water quality degradation or alteration of drainage patterns. This impact would be less than significant with implementation of the existing regulatory requirements. No mitigation is necessary.

Further, there is no existing or planned stormwater system that drains the sites of any of these proposed new impervious surfaces, so there would be no impact related to exceeding the capacity of such a system, or providing additional sources of stormwater pollutants.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to the potential for stormwater runoff to violate water quality standards and waste discharge requirements, or to exceed the capacity of or alter a stormwater drainage features. No mitigation is required.

Impact HY-3: Use of the trails under the proposed access program and variants would not violate water quality standards or waste discharge requirements, otherwise substantially degrade water quality, exceed the capacity of an existing or planned stormwater drainage system, provide a substantial additional source of polluted runoff, or alter drainage patterns. (Less than Significant)

Proposed Access Program (Docent Program on Fifield-Cahill Ridge Trail Components and Unsupervised/Restricted Access on Southern Skyline Ridge Trail)

As analyzed in the management plan EIR, public use of new trails could indirectly increase the potential for water quality degradation as a result of unauthorized body contact with reservoir or creek water, use by domestic animals, erosion from off-trail use, littering, and increased fire hazards.[25] Under the proposed access program, access to the Fifield-Cahill ridge trail would be restricted and supervised by a docent, and access to the southern skyline ridge trail would be unsupervised and restricted by permit. As explained in this EIR's Chapter 2, Project Description, Section 2.7.1, Trail Access Management Program and Visitation, total annual visitation under the project is expected to be somewhat less than 50,020 people per year, which represents an upper-limit estimate for unsupervised/unrestricted visitation to project trails, as identified in the visitor use study prepared for this EIR analysis.[26]

As the management plan EIR explains, the use of docents along the Fifield-Cahill ridge trail would help to control behaviors that could result in the types of indirect water quality impacts noted above.[27] Specifically, trail users under docent supervision on the Fifield-Cahill ridge trail would be unlikely to litter, recreate (e.g., wade) in reservoirs or drainages that are tributary to the reservoirs, or engage in unauthorized off-trail activities or behaviors that could start fires. The management plan EIR concludes that this impact would be less than significant for docent-led access on the Fifield-Cahill ridge trail, because trail users would be supervised and less likely to engage in behaviors that could result in water quality impacts.[28] Consistent with the findings of the management plan EIR, and for the same reasons, increased public use of the Fifield-Cahill ridge trail under the proposed access program would not result in substantial adverse indirect effects related to degradation of water quality.

Under the proposed access program, visitation along the southern skyline ridge trail would be unsupervised and restricted to visitors with a permit. As part of this permit program, visitors would be required to complete an educational program with an emphasis on visitor rules and restrictions and the importance of staying within the designated trails to prevent erosion or disturbance of other areas. As discussed in the management plan EIR, unsupervised public use of new trails could increase the potential for indirect water quality degradation as a result of

25 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (pp. III.D-10 to III.D.13); Section V.D, Hydrology and Water Quality (pp. V-13 and V.14).

26 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

27 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.D. Hydrology and Water Quality (p. V-16).

28 ESA+Orion, *Land Manager Survey, Memorandum*, January 9, 2018.

unauthorized body contact with reservoir or creek water, use by domestic animals, erosion from off-trail use, littering, and increased fire hazards.[29] As also noted above, the land manager survey conducted for this EIR concludes that unsupervised access leads to improper uses (e.g., camping, off-trail travel, and litter) that can adversely affect water quality.[30] The management plan EIR concludes that implementation of Program-Level Mitigation Measure D.1 would reduce indirect impacts to a less-than-significant level under a project access option that provides unsupervised southern skyline ridge trail access.[31] Program-Level Mitigation Measure D.1 calls for implementation of the Peninsula Watershed Management Plan actions and policies that minimize the potential for adverse effects on water quality.

As discussed for the proposed access program in this EIR's Chapter 2, Project Description, Section 2.7.1, Trail Access Management Program and Visitation, the SFPUC would install barbed-wire fencing and lockable gates along the southern skyline ridge trail. The public could access the trail through these gates for approximately eight hours per day during daylight hours. The SFPUC would ensure that permit holders have completed educational programs that emphasize the importance of protecting water quality. The trail realignment and bridge would avoid the wetlands identified along the southern skyline ridge trail, and SFPUC project operations and maintenance activities would similarly avoid these areas. However, as discussed in Impact HY-2, visitors would be allowed to traverse the drainage that bisects the unimproved portion of the trail alignment. Visitor traffic could cause disturbances to soils and potential siltation when water is present in the drainage. However, because the drainage is seasonal and is located a considerable distance (approximately 1 mile) from any receiving waters, the potential impact would be less than significant.

As also noted in Chapter 2, Project Description, Section 2.7.2, Trail and Facilities Operation and Maintenance, the SFPUC staff's watershed maintenance activities would include daily patrol of the trails to monitor use activities and check visitors for valid permits. Consistent with the Program-Level Mitigation Measure D.1, implementation of these security measures and increased monitoring and maintenance activities under the proposed access program on the southern skyline ridge trail would reduce the potential for substantial indirect water quality impacts associated with unauthorized watershed access, including littering, animal wastes, recreating in reservoirs and drainages, and soil erosion from the creation of informal trails. As a result, the impact would be less than significant.

Mitigation: None required.

[29] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (p. III.D-10).
[30] ESA+Orion, *Land Manager Survey, Memorandum*, January 9, 2018.
[31] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.D, Hydrology and Water Quality (p. IV-2).

Access Program Variant 1 (Docent Program)

As analyzed in the management plan EIR and described above for the proposed access program along Fifield-Cahill ridge trail, implementation of variant 1 (docent program) would also have a low potential for water quality degradation resulting from unauthorized body contact with reservoir or creek water, use by domestic animals, erosion from off-trail use, littering, and increased fire hazards, because trail users would be supervised and less likely to engage in behaviors that could result in water quality impacts.[32] Also, the trails would avoid the wetlands identified along the loop trail and southern skyline ridge trail, and a pedestrian bridge would span the existing drainage along southern skyline ridge trail. For the same reasons presented for the proposed access program, above, the SFPUC's project operations and maintenance activities, and visitor traffic along the unimproved portion of the trail alignment, would not generate substantial amounts of pollution that could affect receiving waters. Therefore, consistent with the management plan EIR's impact conclusions,[33] access program variant 1 would have a less-than-significant impact related to violation of water quality standards and waste discharge requirements, and exceedance of the capacity or alteration of stormwater drainage features.

Mitigation: None required.

Access Program Variant 2 (Unsupervised/Unrestricted Access)

The management plan EIR indicates unsupervised public use of new trails would increase the potential for indirect water quality degradation, as described above.[34] In general, the greater the public use of trails, the greater the potential for water quality impacts. The findings of the land manager survey conducted as part of this analysis also support this conclusion.[35] The management plan EIR concludes that implementation of Program-Level Mitigation Measure D.1 would reduce indirect impacts to a less-than-significant level under a project access option that provides unsupervised trail access.[36] Program-Level Mitigation Measure D.1 calls for implementation of the Peninsula Watershed Management Plan actions and policies that minimize the potential for adverse water quality impacts. The project would be consistent with the stormwater drainage control requirements, which include signage and litter control measures.

Under access program variant 2, the project would add new trails and remove barriers to access (e.g., reservations and docents), which could substantially increase visitation. Variant 2 would open the Fifield-Cahill ridge trail, the loop trail, and the southern skyline ridge trail to unsupervised access by hikers, bicyclists, and equestrians, and up to approximately 50,020 individuals per year could visit the project area.[37] This variant could cause indirect water quality

32 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.D, Hydrology and Water Quality (p. V-16).
33 Ibid.
34 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.D, Hydrology and Water Quality (pp. III.D-10 to III.D.13); Section V.D, Hydrology and Water Quality (pp. V-13 and V.14).
35 ESA+Orion, *Land Manager Survey, Memorandum,* January 9, 2018.
36 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.D, Hydrology and Water Quality (p. IV-2).
37 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

impacts from unauthorized off-trail activities, such as an increased potential for erosion, wildfires, and littering, or increased nutrient levels or coliform bacteria in reservoirs. As mentioned above, these effects would be greatest where the trails cross areas of high water quality vulnerability, such as the saddle between Fifield and Cahill ridges (the Five Points area) and four areas along the southern skyline ridge trail.

However, as discussed in Chapter 2, Project Description, Section 2.7.1, Trail Access Management Program and Visitation, under variant 2 the SFPUC would install barbed-wire fencing and lockable gates along the southern skyline ridge trail and Fifield-Cahill ridge trail, encompassing the entire length of the loop trail. The public could access the trails through these gates for approximately eight hours per day during daylight hours. As also noted in Chapter 2, Section 2.7.2, Trail and Facilities Operation and Maintenance, the SFPUC staff's monitoring and maintenance activities for trail facilities and amenities (e.g., restrooms, trash receptacles, fencing) would increase from existing levels to accommodate the increase in visitation. Therefore, consistent with the management plan EIR's impact conclusions,[38] implementation of these security measures and increased monitoring and maintenance activities under variant 2 would reduce the potential for substantial indirect water quality impacts associated with unauthorized watershed access, including littering, animal wastes, recreating in reservoirs and drainages, and soil erosion from the creation of informal trails. For the same reasons presented for the proposed access program, above, the SFPUC's project operations and maintenance activities, and visitor traffic along the unimproved portion of the trail alignment, would not generate substantial amounts of pollution that could affect receiving waters. Variant 2 would, therefore, have a less-than-significant impact related to violation of water quality standards and waste discharge requirements, and exceedance of the capacity or alteration of stormwater drainage features.

Mitigation: None required.

Access Program Variant 3 (Unsupervised/Restricted Access)

Access program variant 3 would add new trails and remove barriers to access (e.g., reservations and docents), which could substantially increase visitation. However, given the additional permit requirement, the number of visitors would likely be reduced relative to variant 2. For the same reasons described for the southern skyline ridge trail under the proposed access program (e.g., project description elements that would restrict off-trail visitation and reduce wildfire hazards), implementation of variant 3 would have a less-than-significant impact related violation of water quality standards and waste discharge requirements, and exceedance of the capacity or alteration of stormwater drainage features.

Mitigation: None required.

Impact Conclusion for the Proposed Access Program

Trail use under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail would result in less-than-significant impacts related to the potential

[38] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.D, Hydrology and Water Quality (p. V-16).

for stormwater runoff to violate water quality standards and waste discharge requirements, or exceed the capacity of or alter stormwater drainage features. No mitigation is required.

Cumulative Impacts

Impact C-HY-1: The project, in combination with past, present, and probable future projects in the site vicinity, would not result in significant adverse cumulative hydrology impacts. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed throughout this EIR and summarizes the cumulative projects in the vicinity of the project. Hydrology impacts are related to the potential to violate water quality standards, alter drainage patterns, or otherwise substantially degrade water quality. The geographic scope of these cumulative impacts is restricted to the drainage areas of the Upper and Lower Crystal Springs reservoirs where the southern skyline ridge trail and Fifield-Cahill ridge trail improvements would be located, as well as the drainage areas of the San Andreas and Pilarcitos reservoirs and San Mateo Creek where the Fifield-Cahill ridge trail is located.

All of the potential cumulative projects listed in Table 4.1-1 would be located at least partially within one of these drainage basins. The cumulative projects are all roadway or pipeline improvement projects that could result in erosional effects and associated water quality impacts during construction. As discussed above in Section 4.10.2.2, *State Regulations*, regulations governing stormwater runoff (i.e., construction general permit) include requirements for the implementation of measures to prevent pollutants from contacting stormwater, with the intent of keeping all products of erosion and stormwater pollutants from moving off site into receiving waters.

As discussed in Impact HY-1, compliance with the construction general permit, which is mandatory, would effectively control stormwater runoff from the project construction sites, and water quality impacts during project construction would be less than significant. Because each of the projects listed in Table 4.1-1 would be subject to the same regulatory requirements, cumulative water quality impacts during construction would be less than significant.

None of the projects listed in Table 4.1-1 would result in a permanent change in stormwater flows, provide an additional source of stormwater pollutants, or alter drainage patterns. Therefore, there would be no significant cumulative impact related to these topics. While some of the projects could result in water quality impacts related to wetlands, the project would generally avoid wetlands and would not contribute to this cumulative impact.

Mitigation: None required.

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4.11 Hazards and Hazardous Materials

This section describes the existing hazardous materials environment in the project area and addresses the potential hazards and hazardous materials impacts associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project with the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). The impact analysis includes an evaluation of the use of hazardous materials during construction, the potential to encounter hazardous materials and naturally occurring asbestos in soil, the potential to interfere with an emergency response plan, and wildfire hazards.

Of the comments received during the public scoping period, comments on the topic of hazards and hazardous materials generally concern compliance with fire codes, the Watershed Fire Management Plan, the effects of unsupervised access on wildfire occurrence, and the need for adequate funding and staffing to mitigate fire risk. Section 4.11.1.3, *Wildfires*, Section 4.11.2, Regulatory Framework, and Section 4.11.3, Impacts and Mitigation Measures, address these comments.

4.11.1 Environmental Setting

This section discusses the potential for hazardous materials and naturally occurring asbestos to be present in the soil where construction activities would occur, and fire hazards and protection services related to the southern skyline ridge trail, Fifield-Cahill ridge trail, and proposed improvements. The setting described herein lies entirely within the geographic scope of the Hazards and Hazardous Materials and Fire Management settings described in the Peninsula Watershed Management Plan Final Environmental Impact Report (management plan EIR). Additional information regarding the potential for hazardous materials to be present in the soil and fire hazards is available in the management plan EIR, all of which remains valid and is incorporated herein by reference. The regulatory framework related to these topics is also presented in this section.

4.11.1.1 Use of Hazardous Materials and Environmental Cases

As characterized in the management plan EIR, the southern skyline ridge trail, universal access (Americans with Disabilities Act-compliant) loop trail, and associated improvements would be located primarily within wildlands. Hazardous materials are not generally stored or used in this portion of the watershed.

A search of the California State Water Resources Control Board GeoTracker database in January 2018 did not identify any listed hazardous materials sites with known soil or groundwater contamination along either trail alignment or in the location of any of the proposed facilities.[1]

[1] State Water Resources Control Board, GeoTracker, Skylawn Memorial Park (T0608101124), *http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0608101124*, accessed January 3, 2017.

Skylawn Memorial Park, adjacent to the Fifield-Cahill ridge trail and proposed improvements north of State Route 92 (S.R. 92), experienced a leak of heating oil in 1965 that affected soil quality. However, the water resources board closed this case in 2000, and based upon the board's action and the leak location outside of the project footprint, the spill would have a low potential to affect soil quality in the location of any of the proposed improvements.

As described in the management plan EIR, historical operations at the Skyline Quarry could have included the use and storage of hazardous materials.[2] Therefore, hazardous materials could be present in the soil at the quarry if a past release of these materials occurred. San Francisco and San Mateo counties' police periodically used a site of approximately 150,000 square feet within the abandoned Skyline Quarry to detonate miscellaneous ordnance or suspicious packages found within their respective jurisdictions; however, this no longer occurs.[3]

4.11.1.2 Naturally Occurring Asbestos and Metals

In 1986, the California Air Resources 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*[4] and *ultramafic*[5] rock types, such as mélange and greenstone of the Franciscan Complex. Mélange is a mixture of rock materials of differing sizes and types typically contained within a sheared matrix, and greenstone consists of altered ultramafic volcanic rocks. *Chrysotile asbestos* (a form of asbestos from the serpentine mineral group) and *amphibole asbestos* (including tremolite and crocidolite) are naturally occurring asbestos minerals that are known to occur in mélange and greenstone. Some occurrences of ultramafic rock are also known to have elevated concentrations of naturally occurring metals such as arsenic, cobalt, copper, chromium (including hexavalent chromium), and nickel.[6] Naturally occurring asbestos and metals may present a human health hazard if they become airborne and are inhaled.

As discussed in Section 4.9, Geology, Soils, and Paleontological Resources, the northernmost portion of the southern skyline ridge trail alignment, where the SFPUC would construct a parking lot, crosses a mélange of Franciscan Complex bedrock, which can have naturally occurring asbestos fibers. However, naturally occurring asbestos was not detected in four soil samples collected from the parking lot area in support of the geotechnical investigation for the

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2 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.M, Hazardous Materials and Hazardous Waste (p. V-44), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

3 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.M, Hazardous Materials and Hazardous Waste (p. III.M-2).

4 Serpentinite is a rock consisting of one or more serpentine minerals formed when ultramafic rocks have been metamorphosed (ultramafic rocks formed in high-temperature environments well below the surface of the earth), and is commonly associated with ultramafic rock along faults such as the San Andreas fault. Serpentinite commonly contains chrysotile, an asbestiform variety of the serpentine minerals.

5 Utramafic rock is an igneous (i.e., formed from the solidification of molten rock material) rock with a very low silica content and rich in minerals such as hypersthene, augite, and olivine.

6 Wilcke, Wolfgang, *Small-Scale Variability of Metal Concentrations in Soil Leachates,* Soil Science Society of America Journal 64, 2000: pp. 138 to 143. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

southern skyline ridge trail.[7] Similarly, the proposed 50-vehicle parking lot and the smaller four-vehicle lot north of Cemetery Gate along the Fifield-Cahill ridge trail would be constructed on greenstone of the Franciscan Complex bedrock. However, the asbestos content of this rock and the overlying soil has not been determined.[8]

4.11.1.3 Wildfires

Definition of Wildfire Hazards

A wildland fire is any non-structure fire that occurs in vegetation or natural fuels, including purposeful fires such as prescribed burns, while a wildfire is an unplanned and unwanted wildland fire.[9] Wildfires can be caused by factors such as unauthorized human-caused fires or escaped prescribed burn projects, and they also include all other wildland fires where the objective is to put the fire out. For a fire to occur, there first has to be an ignition source such as a lightning strike or human actions. The degree of fire risk depends on the fire hazard, resources at risk, fire behavior, and the available fire protection system. These are described as follows:[10]

- **Fire hazard** refers to the fuels on a site, typically represented by plant biomass (plant material) and its location and condition, which may lead to difficult-to-control fires. Chaparral, grassland, brush, and conifer or eucalyptus tree stands present the greatest fire hazards in the Peninsula Watershed. Dense hardwood forests present lower fire hazards, although wildfires can spread through litter (decaying matter on the forest floor).
- **Resources at risk** in the Peninsula Watershed include personal safety; property values (homes, watershed facilities, and the Filoli Estate); natural resources (special-status plant and animal species, wildlife habitat, recreational resources, and water resources); and water quality in the SFPUC reservoirs.
- **Fire behavior** is dependent on factors such as the slope where the fire occurs, the surface fuel loading and arrangement, and the presence of tall trees with limbs extending to the ground (these limbs create a ladder of fuel that can transport fire from the ground to the upper tree canopy). Weather conditions can also influence both the ignition potential of a fire as well as the intensity, rate, and direction of fire movement. Wind, temperature, and humidity are the most important weather variables used to predict fire behavior. May to October is the time of the greatest fire danger in the Peninsula Watershed because these are the driest months of the year. However, due to the fog and moisture caused by fog drip, only an average of 15 days are considered to be extreme fire weather conditions.
- **Fire protection systems** include the available fire protection infrastructure system such as equipment, trained personnel, and fire defense improvements. These resources are important elements in determining the capacity of fire service personnel to control fire and protect the resources at risk. Fire defense improvements include fuelbreaks, roads, water sources, gates, and helispots and can aid in the effectiveness of fire suppression. Steep slopes, such as those

7 AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.
8 Ibid.
9 National Wildfire Coordinating Group, *Glossary A-Z, https://www.nwcg.gov/glossary/a-z#letter_w*, accessed January 17, 2017.
10 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (pp. III.G-1 to III.G-7).

in the northern portion of the southern skyline ridge trail alignment, can also limit accessibility for firefighters.

As many as 90 percent of wildland fires in the United States are caused by humans.[11] Some human-caused fires result from campfires left unattended, debris burning, negligently discarded cigarettes, and intentional acts of arson. The remaining 10 percent are started by natural causes such as lightning or lava.

Wildfire History

As summarized in the management plan EIR and in the Peninsula Watershed Management Plan, large fires have been historically concentrated in the northern portion of the watershed.[12] The roads and highways that bisect and border the Peninsula Watershed have not been a major source of recorded ignitions. Instead, episodes of fire ignitions have occurred primarily off of Sawyer Camp Road and Army Road. A smaller number of fires have started near State Route 35 (S.R. 35).[13]

Several documented large wildfires occurred in the watershed between 1877 and 1929, and interviews with watershed staff indicate that the last major fire occurred in 1946. Interviews with watershed management staff also indicate that some small fires occurred during the 1960s and 1970s, some of which SFPUC staff characterized as suspicious and may have been related to illegal camping or fireworks. In 1973, there were 30 fires on the Sawyer Camp Trail, which back then was open to vehicular traffic.[14]

Some fires have also occurred in the southern portion of the watershed. These fires were started in the grass and burned easterly but were stopped at S.R. 35. While one fire was 50 acres, most were under 10 acres, and a few were between 10 and 15 acres. Wildfires within the watershed have not resulted in any damage to private homes.

Vegetation of the Project Area and Resources at Risk

As discussed in Section 4.8, Biological Resources, the project area supports grassland (non-native grassland and serpentine bunchgrass), herbaceous wetland, coyote brush scrub, coffeeberry scrub, poison-oak scrub, arroyo willow thicket, coast live oak woodland, California bay forest, tanoak forest, Douglas-fir forest, coast redwood forest, eucalyptus groves, Monterey pine and Monterey cypress forest stands, and developed habitats.

Throughout the project area, personal safety and natural resources, including special-status plant and wildlife species, are susceptible to fire risk. In the vicinity of the southern skyline ridge trail, other resources at risk include private residences, the Filoli Estate, and recreational facilities associated with the Purisima Creek Redwoods and Miramontes Ridge open space preserves.

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11 U.S. Department of the Interior, National Park Service, *Wildfire Causes*, *https://www.nps.gov/fire/wildland-fire/learning-center/fire-in-depth/wildfire-causes.cfm*, accessed September 27, 2017.

12 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-1); *Peninsula Watershed Management Plan*, Appendix A-1 (pp. 9 to 11).

13 S.R. 35 is also Skyline Boulevard in this location.

14 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-1); *Peninsula Watershed Management Plan*, Appendix A-1 (pp. 9 to 11).

Other resources at risk in the vicinity of the Fifield-Cahill ridge trail include the Skylawn Memorial Park, a watershed keeper cottage, and aboveground water facility structures.[15]

Wildfire Hazards in the Project Area

As described in management plan EIR,[16] the understory of the forests and shrubs in the Peninsula Watershed is primarily composed of litter, which is a source of ignitable material—especially during the drier summer and autumn months when the only source of precipitation is condensed water of the fog. There has not been a major forest fire on the watershed lands since 1946, and recent watershed fires have been limited to under 500 acres.[17] The SFPUC has an active wildfire pre-suppression program that maintains fuelbreaks and firebreaks, controls roadside vegetation, and reduces risks in high fire hazard areas.[18]

The management plan identifies wildfire severity zones in the Peninsula Watershed, which are classified as high, moderate, or low severity, based on dwelling density, slope, vegetation as a fuel source, and fuel hazard ratings.[19] The southern skyline ridge trail would be primarily located in an area mapped with a moderate wildfire severity, although the trail alignment crosses several isolated zones of high wildfire severity. The SFPUC would also undertake the Fifield-Cahill ridge trail improvements in areas of moderate wildfire severity, but close to areas of high wildfire severity. The existing Fifield-Cahill ridge trail follows a narrow area mapped as moderate wildfire severity, bordered on both sides by areas of high wildfire severity.

The Peninsula Watershed is located within a California Department of Forestry and Fire Protection (CalFire) *state responsibility area*.[20] Mapping conducted by CalFire in 2007, subsequent to publication of the management plan EIR, indicates that the northernmost portion of the southern skyline ridge trail is located primarily in a moderate fire hazard severity area, while the southernmost portion is located primarily in a very high fire hazard severity area, as shown on Figure 4.11-1. Along the Fifield-Cahill ridge trail, the SFPUC would locate the proposed universal access loop trail and loop trail parking lot in a high fire hazard severity area, while the proposed 50-vehicle parking area and amenities south of Cemetery Gate would be located in a very high fire hazard severity area. The majority of the Fifield-Cahill ridge trail crosses areas of both high and very high fire hazard severity; the segment along Quarry Road is located in a moderate fire hazard severity area, except at the very northern portion, which crosses a very high fire hazard severity area.

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15 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.G, Fire Management (p. V-33).

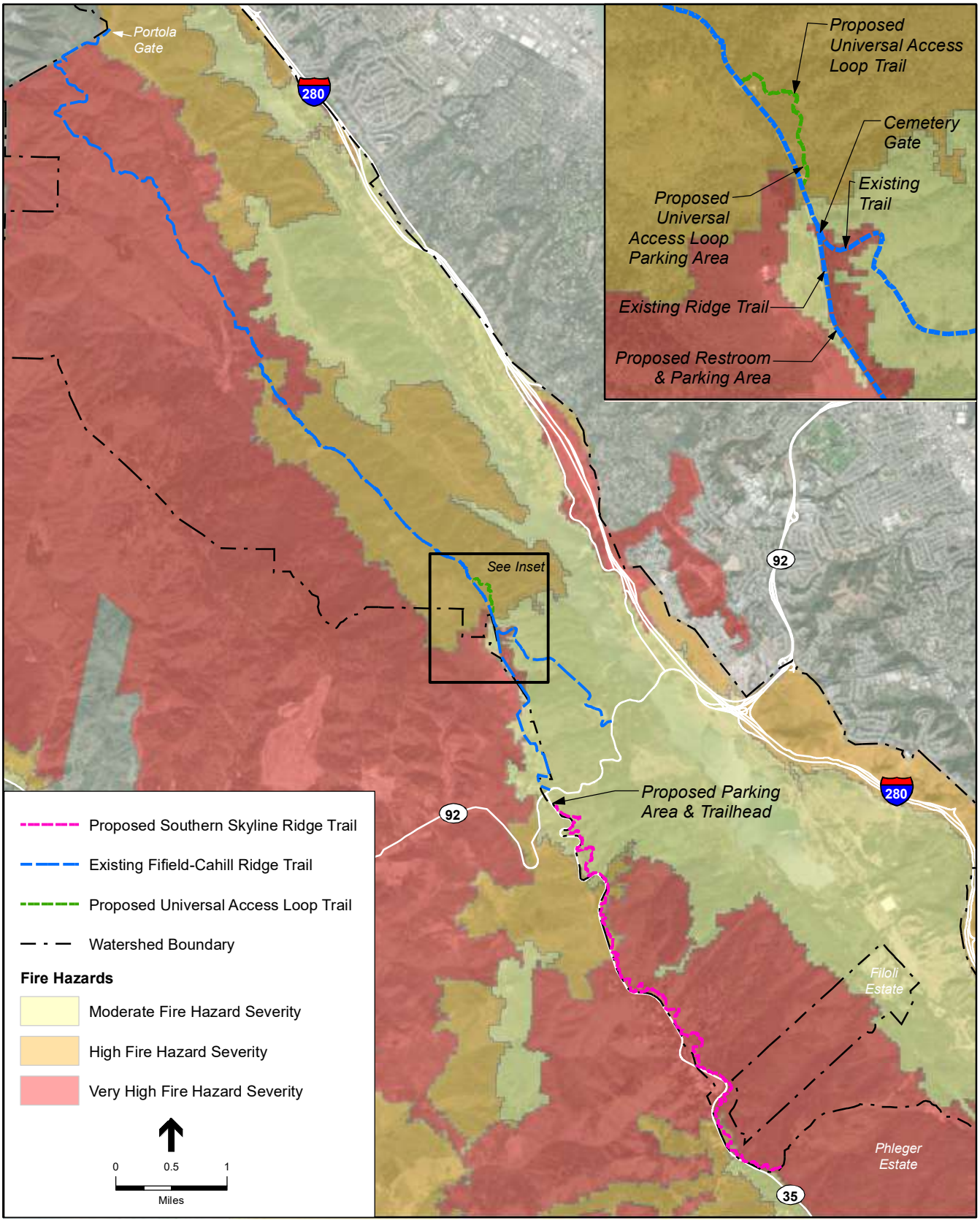
16 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-1).

17 Naras, Joe, Watershed Manager, and John Fournet, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, October 23, 2017.

18 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Appendix A-1, *Peninsula Watershed Fire Management Element,* Spring 2002, *https://sfwater.org/modules/showdocument.aspx?documentid=756*, accessed May 18, 2018.

19 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan*, Figure 2-9, Spring 2002.

20 A state responsibility area is an area where the state is responsible for fire protection.



SOURCE: Cal Fire San Mateo County FHSZ Map; ESRI Imagery

Southern Skyline Boulevard Ridge Trail Extension

Figure 4.11-1

Fire Hazard Severity Map

Fuelbreaks

The SFPUC maintains a number of fuelbreaks within the Peninsula Watershed to retard the spread of potential fires.[21] The entire length of S.R. 35 between S.R. 92 and Phleger Estate (adjacent to the southern skyline ridge trail alignment) is maintained as a fuelbreak, referred to as the Upper S.R. 35 fuel reduction. In addition, the SFPUC maintains a fuelbreak along Fifield Ridge and the Pilarcitos power line, which crosses the saddle between Fifield and Cahill ridges.

Fire Protection Services and Facilities

The adequacy of fire protection services is related to a combination of the available firefighting infrastructure (equipment and personnel training), site characteristics (such as slope steepness), and the availability of fire roads and trails to provide access by firefighters. Fire protection services in the Peninsula Watershed are provided by both CalFire and the SFPUC, as described below. In addition, the volunteer fire brigade of the Kings Mountain Fire Department has a station on S.R. 35 (at the northwest edge of Phleger Estate) that is available to respond to community emergencies.

California Department of Forestry and Fire Protection

Because the Peninsula Watershed is located within a state responsibility area, CalFire is responsible for providing fire protection services. (CalFire provides fire protection to over 31 million acres of land in California within state responsibility areas). In addition to providing fire protection services in the state responsibility area, CalFire contracts with the Coastside Fire Protection District in San Mateo County.

The Peninsula Watershed is located within CalFire's San Mateo–Santa Cruz unit. This unit staffs 17 paid fire stations and supports eight county-funded volunteer fire companies. With assistance from CalFire, these companies respond to over 8,700 emergency incidents a year and protect 416,290 acres of state responsibility area and 183,707 acres of local responsibility lands.[22] The San Mateo–Santa Cruz unit is a combination of state, county, and local fire district resources that collectively respond to a wide variety of emergencies, including wildland, structure, and vehicle fires; vehicle accidents and medical aids; cliff and water rescues; and hazardous material incidents. For any fire that the SFPUC cannot immediately and easily suppress, CalFire dispatches firefighters and coordinates response to the fire. When the amount of equipment needed to control an emergency incident exceeds the resources of CalFire, the department hires private-sector equipment and services to supplement its own resources. In addition, CalFire provides many other watershed services, including inspections, training, and emergency planning.

The Peninsula Watershed is located within CalFire's Battalion 1 of the San Mateo–Santa Cruz unit.[23] This battalion is responsible for assisting in identifying implementation of fuelbreak and fuel reduction projects within its service area. Battalion 1 has completed a fuel reduction project

[21] San Francisco Public Utilities Commission, *Peninsula Fuel Management Units*, March 26, 2012.
[22] CalFire, *San Mateo–Santa Cruz Unit*, *http://www.fire.ca.gov/CZU/chiefsmessage*, accessed July 2, 2018.
[23] CalFire, *San Mateo–Santa Cruz Unit, CZU Unit Strategic Fire Plan*, 2016.

(fuelbreak) along S.R. 35, south of S.R. 92 (near the proposed southern skyline ridge trail), that will have ongoing maintenance needs.

The closest CalFire station to the Peninsula Watershed is Belmont Station No. 17 in San Mateo, located approximately 4.5 miles by road from the southern skyline ridge trail proposed trailhead. S.R. 92 and S.R. 35 provide access to the southern skyline ridge trail and Fifield-Cahill ridge trail and proposed improvements areas, as well as a maintenance/fire access roads within the watershed that connect to the Fifield-Cahill ridge trail. The nearest air support is Alma Helitack in the Santa Clara unit, located off of S.R. 17 adjacent to Lexington Reservoir.[24] The helicopter at this facility is available to provide initial attack as well as extended fire suppression in the watershed.

San Francisco Public Utilities Commission

The response time by CalFire and adjacent fire suppression jurisdictions to the Peninsula Watershed can be long because of the watershed size and distance to incident response facilities. Therefore, SFPUC staff are trained and equipped to provide an initial response to fires on the watershed until CalFire units arrive. Accordingly, the SFPUC equips watershed keeper vehicles with a 100-gallon pumper capacity that allows trained staff to respond to small fires.[25] However, most fires are the responsibility of CalFire and associated firefighting agencies.

As summarized in the management plan EIR, developed water sources for fire suppression in the Peninsula Watershed are limited.[26] They include 13 hydrants and seven water tanks. The SFPUC has since addressed previous issues regarding the compatibility of valves and other firefighting equipment mentioned in the management plan EIR.[27] Other completed improvements include fire water suppression improvements, including water access/availability, helispot creation and maintenance, vehicle clearance maintenance for fire truck access, road turnouts for improving vehicle access, and fuel and fire break maintenance activities.[28]

San Mateo–Santa Cruz Unit Strategic Fire Plan

Developed collaboratively between CalFire and the State Board of Forestry and Fire Protection, the Strategic Fire Plan for CalFire's San Mateo–Santa Cruz unit[29] establishes a vision, goals, and objectives for living with the risk of wildfire. This plan describes the firefighting unit, summarizes resources available to the unit for firefighting and prevention, and describes fire prevention and vegetation management programs. The vegetation management program collaborates with Fire Safe councils, community groups, and cooperating agencies in all aspects of fuel management project planning, development, and implementation. The plan identifies three fuel reduction

24 Ibid.
25 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Appendix A-1, *Peninsula Watershed Fire Management Element* (pp. 9 to 11, and pp. 54 to 55), Spring 2002.
26 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-8).
27 Naras, Joe, Watershed Manager, and John Fournet, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, October 23, 2017.
28 Fournet, John, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, August 14, 2018.
29 CalFire, *San Mateo-Santa Cruz Unit, CZU Unit Strategic Fire Plan*, 2016.

projects completed by the SFPUC in the Peninsula Watershed. These include the Southern Fuelbreak, completed in the early 2000s; the Upper S.R. 35 Fuel Reduction (fuelbreak), completed in 2012 and is described above; and S.R. 35 Thinning (fuel reduction), completed in 2013.

San Mateo County–Santa Cruz County Community Wildfire Protection Plan

The San Mateo–Santa Cruz County Community Wildfire Protection Plan[30] identifies wildfire hazards in the San Mateo–Santa Cruz unit and provides strategies to address wildfire risk and restore healthier, more resilient ecosystems while protecting life and property. In addition to providing recommendations for safe construction in fire-prone areas, the plan prioritizes fuel reduction projects for reducing fire risks in the San Mateo–Santa Cruz unit. Identified priorities include reducing fuels adjacent to roads, constructing strategically placed fuelbreaks, and constructing roadside fuelbreaks.

The wildfire protection plan divides the San Mateo–Santa Cruz unit into 10 planning areas, and the project site is located along the western border of the San Mateo Interior Planning Area. The San Mateo North-Coastal and San Mateo Central-Coastal planning areas border this area to the west. The plan identifies areas of moderate to high fuel rank hazards along the existing Fifield-Cahill ridge trail and the proposed southern skyline ridge trail.[31]

Fire Safe San Mateo County

Fire Safe San Mateo County is a Fire Safe Council composed of public agencies and municipalities, as well as private agencies, groups, and foundations. San Mateo County formed this council to reduce hazardous vegetation; create defensible space around structures; and educate the public about wildfire fire hazards, fire behavior, and fuel reduction. Council members include CalFire, the San Mateo County Fire Department, the SFPUC, and 16 other organizations. The SFPUC (or the San Francisco Water Department) has been a member of San Mateo County Fire Safe since 2004, and has worked with the council to achieve effective fire protection, fuel load reduction, community education, and pre-fire planning in the Peninsula Watershed. Communities with wildfire protection plans in place are given priority for funding of hazardous fuels reduction projects. Fire councils regularly apply for funding, which is made available primarily through the California Fire Safe Council's grant clearinghouse that combines federal and state funding sources into one place.

Peninsula Watershed Fire Management Element

The Peninsula Watershed Fire Management Element presents a summary of existing conditions in the watershed related to fire hazards and describes the analysis that was performed to assess fire hazard severity zones within the watershed. These topics are described in the previous

30 CalFire, *San Mateo–Santa Cruz Unit, Santa Cruz County San Mateo County Community Wildfire Protection Plan*, May 2010.

31 CalFire established fuel rankings CalFire based on inputs such as the presence of fuels, existing slopes, brush density, and tree density. CalFire uses the methodology to identify and prioritize pre-fire projects to reduce the potential for large, catastrophic fires.

sections.[32] The fire management element also includes recommendations which are incorporated into the Peninsula Watershed Management Plan as fire management actions. Specifically, these actions are derived from the fire management element's Fire Defense Improvement Plan (actions fir2, fir3, fir4, fir5, fir6, and fir7), Fuel Management Plan (action fir8), and Fire Response Plan (actions fir9, fir10, fir11, and fir12) as described further in this section, and detailed in Appendix E, Expanded Hazards Mitigation Measure M-HZ-8: Fire Management Plan. As of the writing of this EIR, these plans were in varying stages of completion, with a number of related initiatives and management actions ongoing, as further discussed below.[33]

Fire Defense Improvement Plan

The Fire Defense Improvement Plan proposed in the fire management element includes recommendations to increase the available water supply for firefighting (providing additional hydrants and tanks as well as modifying the valves on existing tanks to allow access), the addition of helispots to provide access for firefighting helicopters, and access improvements such as road repairs and improvements. Two water tanks and one wet fire hydrant[34] are located in the western portion of the Peninsula Watershed north of S.R. 92, and two wet hydrants and a water tank are located along S.R. 92. South of S.R. 92, the only water tank and hydrants in the western portion of the watershed are located near Filoli Estate. This plan recommends adding four new dry hydrants (action fir2),[35] three helispot landing locations (action fir3), an additional wet hydrant (action fir4), and an additional water tank (action fir5)in the northwestern portion of the watershed. The plan also recommends a new dry hydrant (action fir2) and water tank (action fir5) in the southwestern portion of the watershed. As of this writing, some of these recommendations, including access to draft water at four of seven dry hydrant locations (action fir2); three unpaved helispot locations available (action fir3); a new wet hydrant at Harry Tracy water treatment plant and access to Coastside County Water District and Skylawn Memorial Park wet hydrants (action fir4); a new 10,000 gallon metal water tank at Barrel Springs (action fir5); other watershed access improvements and trail alignments (action fir6); and road turnarounds, turnouts, and safety zones improvements (action fir7) have been completed.[36]

Fuel Management Plan

The Fuel Management Plan is an ongoing annual management plan that includes recommendations to reduce sources of ignitions, minimize the spread of fires, reduce fire intensity, and reduce the potential for *spotting* (depositing burning embers into unburned areas). The fuel management strategies proposed to address these objectives include:

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32 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Appendix A-1, *Peninsula Watershed Fire Management Element,* Spring 2002.

33 Fournet, John, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, August 14, 2018.

34 A wet hydrant is one that is connected to a continuous water source via piping.

35 A dry hydrant is one that is not permanently connected to a water supply, but allows firefighting equipment to pump water from an adjacent water source.

36 Fournet, John, Community Liaison, SFPUC, written correspondence to Environmental Science Associates. August 14, 2018.

- Reducing fuel volumes by removing dead wood from trees and shrubs, thinning forest stands, creating shrub islands from continuous shrub masses, removing shrubs from beneath and around existing and emerging trees, selecting low-growing shrubs and ground covers as replacement plants, and removing/reducing plant litter accumulation
- Reducing fuel flammability by mowing grass as it cures, replacing annual grass with perennial plants that do not dry, establishing a formal irrigated landscape in carefully selected areas, and removing sick and dead shrubs and trees in a timely manner
- Establishing/maintaining fuel discontinuity by removing/reducing *fuel ladders*,[37] creating shrub islands from continuous shrub masses, removing shrubs from beneath and around existing and emerging trees, and creating low fuel zones (referred to as fire breaks) in areas of high fire sensitivity
- Reducing the possibility of fire traveling through tree crowns by thinning flammable tree stands, pruning lower branches larger than 3 inches in diameter to 10 feet above ground, and performing the fuel volume reduction actions described above

The fuel management plan identifies standards (referred to as treatment prescriptions) for management of specific vegetation types in the Peninsula Watershed.[38] These standards were initially developed by Amphion, Inc. for use by the Federal Emergency Management Agency-funded East Bay Hills Vegetation Management Consortium. They have been reviewed and adopted by the following agencies in the consortium: cities of Berkeley, Oakland, and Piedmont; East Bay Municipal Utility District; East Bay Regional Park District; University of California; Lawrence Berkeley Laboratory; and Pacific Gas and Electric Company. As part of the review process, a citizen's advisory committee and a technical advisory committee, composed of members of the public, reviewed and commented on the standards. The standards consider wildlife habitat management, biodiversity, aesthetics, soil stability, and other factors that help determine the optimum treatment of vegetation. The standards have been modified and customized by the SFPUC to fit the specific circumstances in the watershed.

The proposed treatment along Skyline Ridge includes thinning conifer tree stands, mechanically removing shrubs around emerging trees, removing Monterey Cypress, hand-thinning shrubs, creating shrub islands, and mowing of grass lands. Proposed treatments along Fifield and Cahill ridges include constructing fuelbreaks through the removal of some trees; thinning, cutting, and crushing brush; conducting prescribed burns; and mowing grasslands.[39] These treatments and maintenance activities are in process, with some activities completed and others part of ongoing fuel management programs to protect the watershed (action fir8).[40]

37 A fuel ladder is a firefighting term for live or dead vegetation that allows a fire to climb up from the landscape or forest floor into the tree canopy. Common fuel ladders include tall grasses, shrubs, and tree branches, both living and dead.

38 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Appendix A-1, *Peninsula Watershed Fire Management Element,* Spring 2002.

39 Ibid.

40 Fournet, John, Community Liaison, SFPUC, written correspondence to Environmental Science Associates, August 14, 2018.

Fire Response Plan

While the entire Peninsula Watershed is within the state responsibility area, because of the remote nature of the watershed, the SFPUC detects, reports, and provides an initial response to fires on the watershed. The Fire Response Plan of the fire management element provides the framework for the SFPUC's response to fires. The plan provides procedures for detection and reporting of a fire, initial response, and evacuation (if necessary). According to the plan, all fires should be immediately reported to watershed dispatch, which would call 911 (action fir9). The SFPUC equips watershed keeper vehicles with a 100-gallon pumper capacity, and trained staff can respond to small fires with this equipment. Larger fires that cannot be easily contained would be the responsibility of CalFire and associated firefighting agencies (action fir10).[41] The plan establishes an incident command system to coordinate evacuations(action fir11) and disseminate maps and information, and the SFPUC coordinates annual first responder liaison meetings (action fir12).

In addition, the SFPUC coordinates prescribed burn activities with CalFire. The SFPUC and CalFire have a memorandum of understanding to perform prescribed burns on earthen dam faces to reduce wildfire hazards. Similarly, the SFPUC has a Letter of Intent with CalFire codifying the SFPUC's intent to participate in CalFire's prescribed burn vegetation management program (action fir 12).

Climate Change Effects on Wildfire Occurrence

The size, severity, duration, and frequency of fires are greatly influenced by climate. Although fires are a natural part of the California landscape, the CalFire's Fire and Resource Assessment Program reports that the fire season in California and elsewhere seems to be starting sooner and lasting longer; climate change is suspected as a key mechanism in this trend.[42] Between 1987 and 1996, the rolling five-year average was 250,000 to 350,000 acres burned by California wildfires. This increased substantially a decade later when California wildfires burned 400,000 to 600,000 acres between 1997 and 2006. As of 2015, the three largest wildfires in California history occurred in 2003, 2012, and 2013, encompassing more than 800,000 acres of land in California and Nevada.[43] In 2016 alone, 6,986 wildfires burned 564,835 acres of land.[44] However, in October 2017, the Northern California wildfires, also known as the Northern California firestorm, were a series of 250 wildfires that started burning across Napa, Lake, Sonoma, Mendocino, Butte, and Solano counties during severe fire weather conditions. These wildfires, which burned approximately 245,000 acres, were the most destructive ones of the 2017 California wildfire season, causing the costliest damage on record for California.

The increase in wildfires has been attributed, in part, to warmer spring and summer temperatures, reduced snowpack, and earlier spring snowmelt, as well as increased frequency of

41 San Francisco Public Utilities Commission, *Peninsula Watershed Management Plan,* Appendix A-*1, Peninsula Watershed Fire Management Element,* Spring 2002.
42 CalFire, *Fire and Resource Assessment Program, California's Forests and Rangelands: 2010 Assessment*, June 2010.
43 CalFire, *Top 20 Largest California Wildfires*, September 11, 2015.
44 CalFire, *Incident Information, Number of Fires and Acres*, *http://cdfdata.fire.ca.gov/incidents/incidents_stats?year=2016,* accessed April 5, 2017.

Santa Ana conditions (strong down slope winds that blow through the mountain passes in southern California).[45] Warmer and drier conditions may also lead to increased moisture stress that can result in an earlier and thus longer fire season. Alternatively, a wetter climate scenario might reduce the rate of fire spread, but because of the increased vegetation growth, might also increase fuels and thus increase seasonal wildfire fire intensity and overall hazard risk.

CalFire's Fire and Resource Assessment Program reports that wildfire risk will continue to be highly variable across the state. Research suggests that large fires and burned acreage will increase throughout this century, with some declines after mid-century due to vegetation type conversions. Recent research estimates that the wildfire area burned will increase by at least 100 percent in the forests of Northern California.

4.11.2 Regulatory Framework

4.11.2.1 Federal Regulations

There are no federal regulations that apply directly to addressing the hazards and hazardous materials aspects of the project.

4.11.2.2 State Regulations

California Public Resources Code

The California Public Resources Code, beginning with section 4427, includes fire safety regulations that restrict the use of equipment that might produce a spark, flame, or fire; requires the use of spark arresters on any piece of construction equipment that uses an internal combustion engine; specifies requirements for the safe use of hydrocarbon-fueled vehicles, equipment, and tools in fire hazard areas; and specifies fire-suppression equipment that must be provided onsite for various types of work in fire-prone areas. Construction activities for the proposed southern skyline ridge trail and Fifield-Cahill ridge trail and proposed improvements would be located in forest-covered land, brush-covered land, and grass-covered land. However, these code requirements would not apply to the project because they do not apply to the setting of fire on lands within any municipal corporation, such as the SFPUC (see Public Resources Code section 4415).

Asbestos Air Toxics Control Measure

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 Air 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 control measures protect 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,

[45] CalFire, *Fire and Resource Assessment Program, California's Forests and Rangelands: 2010 Assessment*, June 2010.

construction and grading operations, and quarrying and surface mining operations in ultramafic rock, serpentine, or naturally occurring asbestos areas. The Bay Area Air Quality Management District (air district) implements the regulation.

For construction activities that would disturb less than 1 acre of land where asbestos-containing materials are present, construction contractors are required to implement specific best management practices for the control of asbestos-containing dust. For construction activities that would disturb more than 1 acre of land where asbestos-containing materials are present, construction contractors are required to 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 prior to the beginning of construction, 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 provide an exemption from the requirements of the asbestos control measures 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.

The applicability of the asbestos control measures for construction activities in serpentine and other ultramafic rocks areas can be determined through a geologic investigation to analyze the concentration of naturally occurring asbestos in the rock that would be disturbed prior to construction. California Geological Survey guidelines for determining naturally occurring asbestos require that an investigation includes:[46]

- Review of geological, soils, and vegetation references to estimate the extent of soil or rock containing naturally occurring asbestos
- Site-specific mapping of the occurrence of soil and rock containing naturally occurring asbestos
- Use of an appropriate sampling strategy to obtain the most representative information for the project
- Appropriate analytical methods for naturally occurring asbestos

A professional geologist must direct or supervise the geological investigation and reporting.

California Vehicle Code

The transport of hazardous materials is regulated by the California Highway Patrol under the California Vehicle Code. Specific requirements related to hazardous materials are specified in the California Code of Regulations, title 13, division 2, chapter 6. These regulations specify container types, packaging requirements, and placarding requirements as well as requirements for licensing and training for truck operators and chemical handlers.

[46] California Geological Survey, *Guidelines for Geologic Investigations of Naturally Occurring Asbestos, Special Publication 124*, 2002.

4.11.2.3 Local Regulations

Peninsula Watershed Management Plan

The following policies from the Peninsula Watershed Management Plan are related to fire hazards and would apply to this project. There are no applicable policies in the plan related to hazardous materials that relate to the project.

Policy F2: Prohibit smoking, fireworks, and other activities likely to cause a fire, as well as equipment that has not been properly equipped, serviced, and maintained.

Policy F3: Require all lessees and permittees to conduct fire hazard reduction activities.

Policy F4: Suppress fires that threaten life, private property, and/or public safety.

Policy F5: Provide adequate water supplies, road infrastructure, and equipment to allow fire personnel to effectively respond to and suppress fires on the watershed.

Policy F6: Provide staff training to adequately detect, respond to, suppress, and report on fires on SFPUC lands.

Policy F8: Restrict access to the watershed, implement strict fire hazard reduction practices, and initiate the public information processes during periods of extreme fire hazard.

Policy F12: Require that fuel treatment activities be conducted in an ecologically sound manner to the greatest extent possible and that when prescribed burning is undertaken, it strives to mimic natural fire regimes. If mowing and disking are both feasible management tools, disking is the preferred strategy from an environmental perspective.

Policy F13: Actively manage fuels in a timely manner to reduce ignition potential, minimize surface fire spread/compartmentalize fires, reduce/minimize fire intensity, and reduce ember production and distance cast.

4.11.3 Impacts and Mitigation Measures

4.11.3.1 Significance Criteria

The project would have a significant impact related to hazards and hazardous materials if it were to:

- 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 that is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, 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 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, 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 fires.

4.11.3.2 Approach to Analysis

For the reasons described below, due to the location and nature of the project, there would be no impacts related to the following significance criteria; therefore, these criteria are not discussed further.

- ***Routine transport, use, or disposal of hazardous materials during project operations.*** The management plan EIR states that increased public visitation to the watershed would result in an increased potential for the illegal dumping of hazardous wastes. However, the analysis concludes that this impact would be less than significant because the potential for dumping generally exists in all wildlands and open preserves, and would not constitute a threat to the public or the watershed.[47] Under the project, there would be a low potential for the illegal dumping of hazardous wastes. This is because trail access would be limited to pedestrians, equestrians, and cyclists; during evening and non-public use periods, watershed access points would be secured with fencing and lockable gates; no unauthorized vehicles would be allowed in portions of the project area beyond designated driveway and parking lots; and watershed staff would be onsite daily. These project features would reduce the potential for illegal dumping that could occur as a result of unsupervised access. In addition, project operation would not require the use of hazardous materials beyond those already used for maintenance and upkeep of the watershed lands. Therefore, there would be no impact related to this topic during operation. Impacts related to the use of hazardous materials during construction are addressed below in Impact HZ-1.
- ***Upset and accident conditions involving the release of naturally occurring asbestos during project operations***. When the project is constructed, there would be no further soil excavation required for project operation, and trail users would use designated trails constructed with clean surfacing materials. Therefore, there would be no operational impact related to exposure to naturally occurring asbestos in soil. Impacts related to exposure to naturally occurring asbestos during construction are addressed below in Impact HZ-3.
- ***Location on a listed hazardous materials site.*** As discussed in Section 4.11.1, Environmental Setting, neither the southern skyline nor Fifield-Cahill ridge trails and proposed improvements would be located on a hazardous materials site identified on a government list. Therefore, there would be no impact related to this criterion.
- ***Hazardous emissions and use of hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.*** Project operation would not result in the emission of any toxic air contaminants. The project would not involve the use of

[47] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.M, Hazard Materials and Hazardous Waste (p. III.M-3).

any acutely hazardous materials during construction or operation. While project construction activities would emit diesel particulate matter, a toxic air contaminant, there are no existing or proposed schools within one-quarter mile of any of the proposed facilities. Therefore, this criterion is not applicable.

- ***Safety hazards from public airports.*** There are no public airports or public use airports within 2 miles of the project site. The nearest airport, San Francisco International Airport, is located more than 7 miles north of the project site. Therefore, this criterion is not applicable.
- ***Safety hazards from private airstrips.*** There are no private airstrips near the project. Therefore, this criterion is not applicable.

Project Impacts

Construction Impacts

Construction-related effects are direct or indirect impacts that could occur during construction activities. The analyses identify uses of and potential exposure to hazardous materials, including naturally occurring asbestos, during construction. The analyses also assess the potential for construction activities to impede implementation of an emergency response plan or result in an increased risk of fires. The impact analyses demonstrate whether compliance with regulatory requirements for these activities would ensure that hazards and hazardous materials impacts would be less than significant during construction. Mitigation measures are provided for impacts that would not be less than significant after adherence to applicable regulations.

Operational Impacts

Operational impacts could result from use and maintenance of the proposed trails, parking lots, and ancillary features, including the potential to encounter hazardous materials in the soil, the potential to interfere with an emergency response plan, and the potential for an increase in fire risks. The analysis for exposure to hazardous materials assesses whether trail users could be exposed to hazardous materials potentially present in soil at the Skyline Quarry parking lot. The analysis for interference with emergency response assesses whether traffic as a result of increased trail use could interfere with emergency response efforts in the watershed. If neither of these effects would occur, the impact would be less than significant.

Potential impacts related to wildfire hazards are assessed with respect to the potential for public use of the southern skyline ridge trail and Fifield-Cahill ridge trail and proposed improvement areas to increase wildfire risks in the project area. The analysis discusses wildfire risks for the proposed access program and variants and identifies mitigation measures to reduce these potential risks to a less-than-significant level.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed in this EIR; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. The cumulative impact analysis assumes that

construction and operation of other projects in the geographical area would be subject to the same regulatory requirements as the project.

The cumulative analysis for hazards and hazardous materials impacts 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. The cumulative analysis considers whether there would be a significant, adverse cumulative impact associated with the effects of project implementation in combination with the effects of other projects in the cumulative scenario, 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 effects are deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.11.3.3 Impact Summary

Table 4.11-1 summarizes the impacts of the project related to hazards and hazardous materials, including wildland fire hazards. This table provides separate significance determinations for the proposed access program, variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access).

TABLE 4.11-1
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact HZ-1: Project construction would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	LS	LS	LS	LS
Impact HZ-2: Project construction 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 present in the soil.	LS	LS	LS	LS
Impact HZ-3: Project construction would not result in a significant hazard to the public or the environment through reasonably foreseeable conditions involving the release of naturally occurring asbestos.	LS	LS	LS	LS
Impact HZ-4: Project construction would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LS	LS	LS	LS
Impact HZ-5: Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	LSM	LSM	LSM	LSM

TABLE 4.11-1 (CONTINUED)
SUMMARY OF IMPACTS – HAZARDS AND HAZARDOUS MATERIALS

Impacts	Significance Determinations			
	Proposed Access Program	Access Program Variant 1 (Docent Program)	Access Program Variant 2 (Unsupervised/ Unrestricted Access)	Access Program Variant 3 (Unsupervised/ Restricted Access)
Impact HZ-6: The project 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 present in the soil during operation.	LS	LS	LS	LS
Impact HZ-7: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	LS	LS	LS	LS
Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	LSM	LS	LSM	LSM
Impact C-HZ-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts related to hazards and hazardous materials.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.11.3.4 Impact Analysis

Construction Impacts

Impact HZ-1: Project construction would not result in a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. (Less than Significant)

Project construction would require the use of hazardous materials such as fuels, lubricants, and solvents for construction vehicles and equipment. Without adequate management, storing and using hazardous materials at the project site could result in the accidental release of small quantities of hazardous materials, which could expose construction workers, degrade soils, and/or be picked up by stormwater runoff and affect the downstream environment.

As discussed under Impact HY-1 in Section 4.10, Hydrology and Water Quality, grading and excavation at the project site would be subject to the State Water Resources Control Board General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, order no. 2009-0009-DWQ. The Construction General Stormwater Permit requires implementation of a stormwater pollution prevention plan for projects that disturb 1 or more acres of land. This plan would include best management practices to minimize the risk of a hazardous materials release during construction activities. Examples of housekeeping best

management practices that would likely be included in the stormwater plan for fueling and servicing of equipment are as follows:

- Locating equipment maintenance and fueling areas for mobile equipment at least 200 feet from stream channels, wetlands, or other aquatic sites
- Servicing mobile equipment in designated areas, away from sensitive species or habitats
- Inspecting motorized construction equipment daily for oil, fuel, and coolant leaks prior to initiating work
- Prohibiting the use of any equipment found to be leaking fluids in or within 200 feet of aquatic habitat features
- Placing oil catchment mats under vehicles parked overnight on the work site
- Providing spill prevention and response

Regarding transport of hazardous materials and wastes to and from the project site, the project would comply with the regulations of the California Highway Patrol related to the transportation of hazardous materials. With implementation of the approved controls discussed above, subject to approval and inspection by the City and County of San Francisco (City), and compliance with hazardous materials transportation regulations, the potential for releases of hazardous construction materials during construction to result in a significant hazard to the public or the environment would be less than significant for the proposed access program and variants.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project under the proposed access program along Fifield-Cahill and the southern skyline ridge trails would result in less-than-significant impacts related to significant hazards to the public or the environment. No mitigation is required.

Impact HZ-2: Project construction 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 present in the soil. (Less than Significant)

If hazardous materials were present in the soil, excavation and other project construction activities could expose the public or the environment to hazardous materials. Impacts related to the release of hazardous materials present in the soil were addressed at a programmatic level in the management plan EIR,[48] which concludes that this impact would be less than significant with implementation of Program-Level Mitigation Measures M.1, M.2, and M.3.[49] These mitigation

[48] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.M, Hazardous Materials and Hazardous Waste (pp. III.M-4 to III.M-7).

[49] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.M, Hazardous Materials and Hazardous Waste (pp. IV-5 and IV-6).

measures call for a number of actions, such as implementation of a dust abatement program, soils investigations for hazardous materials, and soil remediation, if warranted.

However, as discussed above in Section 4.11.1, Environmental Setting, a search of the state board GeoTracker database in January 2017 did not identify any hazardous materials sites that could potentially affect soil quality where the SFPUC would construct any of the proposed improvements. Aside from routine watershed operations, vegetation management, and maintenance activities, the project site has remained mostly undisturbed for many years, and the SFPUC has not conducted any activities in the project area that would likely result in substantial soil contamination. Therefore, the potential to encounter hazardous materials in the soil during construction of the proposed access program and variants is low, and the SFPUC would not be required to implement Program-Level Mitigation Measures M.1, M.2, and M.3 to control exposure to hazardous materials in the soil. Impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project under the proposed access program along the Fifield-Cahill and southern skyline ridge trails would result in less-than-significant impacts related to significant hazards to the public or the environment through upset and accident conditions involving the release of hazardous materials present in the soil. No mitigation is required.

Impact HZ-3: Project construction would not result in a significant hazard to the public or the environment through reasonably foreseeable conditions involving the release of naturally occurring asbestos. (Less than Significant)

As discussed in Section 4.11.1, Environmental Setting, Franciscan Complex mélange bedrock can include greenstone units that sometimes contain naturally occurring asbestos, a fibrous mineral that can be a human health hazard if it becomes airborne, in the form of chrysotile (from the serpentine mineral group) or amphibole asbestos (including tremolite and crocidolite) when disturbed. Excavation and grading of bedrock comprised of mélange or greenstone as well as soils derived from this bedrock could release naturally occurring asbestos, thus potentially exposing the public to airborne asbestos unless the SFPUC implements appropriate control measures. The management plan EIR did not specifically address this impact.

The northernmost portion of the southern skyline ridge trail alignment, where the parking lot would be constructed, crosses a mélange of Franciscan Complex bedrock. However, geotechnical investigation did not detect naturally occurring asbestos in four soil samples collected from the parking lot area in support of the geotechnical investigation for the southern skyline ridge trail.[50] Therefore, this impact would be less than significant for the proposed parking lot.

[50] AGS, *Final Report, Supplemental Geotechnical Study, Southern Skyline Boulevard Ridge Trail Extension, San Mateo County, California*, January 2016.

The SFPUC would construct the 50-car and four-car parking lots proposed for the Fifield-Cahill ridge trail north of Cemetery Gate on greenstone of the Franciscan Complex bedrock. The project geologists have not determined the asbestos content of this rock and the overlying soil in this area. If asbestos is present in the bedrock or overlying soil, the public could potentially be exposed to airborne, naturally occurring asbestos and metals during grading for the proposed parking lots, which would be a significant impact. However, the SFPUC is required to comply with the Asbestos Air 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). The control measure requires a geologic investigation to determine the asbestos content of the greenstone and overlying soil, and implementation of applicable portions of the control measure if the investigation identifies naturally occurring asbestos at concentrations of 0.25 percent or greater. The geotechnical investigation would be required to comply with the California Geological Survey's Special Publication 124, Guidelines for Investigations of Naturally Occurring Asbestos in California.[51] The investigation would include:

- Review of geological, soils, and vegetation references to estimate the extent of soil or rock containing naturally occurring asbestos
- Site-specific mapping of the occurrence of soil and rock containing naturally occurring asbestos
- Use of an appropriate sampling strategy to obtain the most representative information for the project
- Appropriate analytical methods for naturally occurring asbestos

A professional geologist or certified engineering geologist would conduct or supervise the geological investigation and reporting. If the investigation were to conclude that construction would disturb rock containing greater than 0.25 percent naturally occurring asbestos, the SFPUC would be required to submit the appropriate notification forms and comply with the appropriate requirements of the control measure, which include preparing and implementing an asbestos dust mitigation plan. The plan is required to specify the following measures:

- Prevent and control visible track-out from the work area.
- Ensure adequate wetting or covering of active storage piles.
- Control disturbed surface areas and storage piles that would remain inactive for seven days.
- Control traffic on onsite unpaved roads, parking lots, and staging areas, including a maximum vehicle speed of 15 miles per hour.
- Control earthmoving activities.
- Control offsite transport of dust emissions that contain naturally occurring asbestos containing materials.

[51] California Geological Survey, *Guidelines for Geologic Investigations of Naturally Occurring Asbestos in California*, *Special Publication 124*, 2002.

- Stabilize disturbed areas following construction.

The SFPUC must submit an asbestos dust mitigation plan to the air district, whose approval would be required prior to the beginning of construction, and as provided for in the Asbestos Air Toxics Control Measure, include alternative measures that provide an equivalent level of dust control in the dust mitigation plan subject to air district authorization. The construction contractor(s) must ensure the implementation of all approved dust mitigation measures throughout the construction project. In addition, if required by the air district, the SFPUC or a qualified third party consultant would conduct air monitoring for offsite migration of asbestos dust during construction activities and modify the dust mitigation plan on the basis of the air monitoring results, if necessary

No other project components would be constructed in areas underlain by soil or rock that would potentially contain naturally occurring asbestos. Therefore, with adherence to the mandatory requirements of the air district's Airborne Toxic Control Measure, construction of the project under the proposed access program and variants would not result in a significant hazard related to the release of naturally occurring asbestos, and this impact would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project under the proposed access program along the Fifield-Cahill and southern skyline ridge trails would result in less-than-significant impacts related to hazards to the public or the environment due to a release of naturally occurring asbestos. No mitigation is required.

Impact HZ-4: Project construction would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

Project construction could interfere with an emergency response or evacuation plan if construction activities would generate traffic that would interfere with emergency access or block roadways that could be used by emergency response vehicles during a wildfire or other emergency. As discussed in Section 4.4, Transportation and Circulation (Impact TR-2), the increase in construction-related traffic would not be substantial enough to pose an obstacle to emergency response vehicles along S.R. 35. Further, none of the construction activities would involve closure of more than one traffic lane on S.R. 35, S.R. 92, or other roads near the project. Therefore, project construction under the proposed access program and variants would not conflict with an adopted emergency response or evacuation plan, and impacts would be less than significant.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

Construction of the project under the proposed access program along the Fifield-Cahill and the southern skyline ridge trails would result in less-than-significant impacts related to interference with an adopted emergency response plan. No mitigation is required.

Impact HZ-5: Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires. (Less than Significant with Mitigation)

As discussed earlier in Section 4.11.1, Environmental Setting, project construction would occur in moderate to very high fire hazard severity areas as mapped by CalFire. The use of construction equipment and potential temporary onsite storage of hazardous materials (e.g., gasoline and diesel fuel) during construction would pose a wildfire risk that could injure workers and the public, and could expose adjacent resources to wildfire hazards. In addition, mechanized vegetation clearing would present the greatest fire danger in vegetated areas that can be highly flammable. If piled onsite, the cleared, dry vegetation could also become a fire fuel.

Potential sources of ignition include equipment with internal combustion engines, gasoline-powered tools, and equipment or tools that produce a spark, fire, or flame. Such sources include sparks from blades or other metal parts scraping against rock, overheated brakes on wheeled equipment, heated emissions-control devices or vehicles, friction from worn or unaligned belts and drive chains, and burned-out bearings or bushings. Sparking as a result of scraping against rock is difficult to prevent. Other hazards could result primarily from poor equipment maintenance. Smoking by construction personnel is also a potential source of ignition during construction.

While the Public Resources Code contains specific requirements for construction activities in fire-prone areas that are designed to minimize the risk of wildfires during construction, these regulations do not apply to lands within municipal corporations, as discussed above in Section 4.11.2.2, *State Regulations*. Therefore, the potential for substantial wildfire risk would remain; the potential impact would be significant. Implementation of Mitigation Measure M-HZ-5, Fire Safety During Construction, during construction would reduce this impact to a less-than-significant level by ensuring implementation of Public Resources Code regulations governing the use of construction equipment in fire-prone areas.

Mitigation Measure M-HZ-5 applies to the construction of all project components.

Mitigation Measure M-HZ-5 – Fire Safety During Construction.

The SFPUC shall require the construction contractor to comply with the following requirements of the Public Resources Code during construction:

- Earthmoving and portable equipment with internal combustion engines shall be equipped with a spark arrester to reduce the potential for igniting a wildfire (Public Resources Code section 4442).
- Appropriate fire suppression equipment shall be maintained during the highest fire danger period—from April 1 to December 1 (Public Resources Code section 4428).

- On days when a burning permit is required, flammable materials shall be moved to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor shall maintain the appropriate fire suppression equipment (Public Resources Code section 4427).[52]
- On days when a burning permit is required, the appropriate fire suppression equipment shall be maintained when portable tools powered by gasoline-fueled internal combustion engines are used within 25 feet of any flammable materials (Public Resources Code section 4431).

Impact Conclusion for Proposed Access Program

Construction of the project under the proposed access program along the Fifield-Cahill and southern skyline ridge trails could result in significant impacts associated with the exposure of people or structures to substantial risk involving wildland fires. Implementation of Mitigation Measure M-HZ-5, Fire Safety During Construction, would reduce impacts associated with wildland fires to a less-than-significant level. For the reasons presented, with implementation of recommended mitigation, construction of the project under the proposed access program would have a less-than-significant impact related to wildland fires.

Operational Impacts

Impact HZ-6: The project 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 present in the soil during operation. (Less than Significant)

As discussed under Impact HZ-2, the January 2018 search of the state board GeoTracker database did not identify any hazardous materials sites that could potentially affect soil quality where any of the project improvements would be constructed. As discussed above in Section 4.11.1, Environmental Setting, the management plan EIR notes that historical operations at the Skyline Quarry could have included the use and storage of hazardous materials.[53] Therefore, hazardous materials could be present in the soil at the quarry if a release of these materials occurred. While users of the Fifield-Cahill ridge trail could park in the existing parking lot at the quarry under the proposed access program and variants, use of the parking lot would not involve any soil-disturbing activities, and trail users would not be exposed to hazardous materials in the soil. Therefore, project operations under the proposed access program and variants would not create a significant hazard through the release of hazardous materials present in the soil, and this impact would be less than significant.

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52 The project would not require a burning permit, but these restrictions would apply when burning permits would be required for projects that do involve burning. This time period would be from May 1 to a date specified by CalFire when the department has determined that hazardous fire conditions have abated for that year. CalFire may also declare that unusual fire hazard conditions exist in the area at any time during the year and impose these requirements.

53 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.M, Hazardous Materials and Hazardous Waste (p. V-44).

Mitigation: None required.

Impact Conclusion for Proposed Access Program

The proposed access program along the Fifield-Cahill and southern skyline ridge trails would result in less-than-significant impacts related to upset and accident conditions involving the release of hazardous materials or waste that might currently be in the soil. No mitigation is required.

Impact HZ-7: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (Less than Significant)

The management plan EIR analyzes impacts related to interference with emergency response and concludes that such impacts would be primarily related to the potential for an increase in wildfire hazards.[54] The management plan EIR concludes that this impact would be less than significant with implementation of the fire management plan, included as Appendix A-1 of the Peninsula Watershed Management Plan in accordance with Program-Level Mitigation Measures G.1, G.2, and G.3.[55] These mitigation measures required implementation of the management plan policies and actions that address road closures, increased public use, and prescribed burns. In addition, project-level mitigation measure G.2 required removal of dead tree limbs in the cypress forest north of Skyline Quarry to remove fire hazards for access management options that provided access to the Fifield-Cahill ridge trail via the Skyline Quarry, including both for docent-led and unsupervised access alternatives.[56] This measure has been implemented by the SFPUC along the Skyline Quarry service road and down Cahill Ridge, and it continues as needed in response to drought conditions and sudden oak death infestations.[57]

In this EIR, impacts related to fire hazards are discussed below in Impact HZ-8. This EIR considers impacts related to impeding emergency response actions to be significant if the project would introduce a substantial number of visitors to the watershed and the resulting traffic could impede emergency response actions. As discussed in Section 4.4, Transportation and Circulation, the proposed access program and variants would not permanently change the existing or planned transportation network, nor would they permanently affect emergency access on area roadways. Therefore, project operation under the proposed access program and variants would not conflict with an adopted emergency response or evacuation plan, and this impact would be less than significant.

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54 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (pp III.G.11 to 13); Section V.M, Hazardous Materials and Hazardous Waste (pp. V-33 to V-34).

55 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.G, Fire Management (p. IV-3).

56 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.G, Fire Management (p. VI-5).

57 Fournet, John, Community Liaison, SFPUC, email correspondence to Yin Lan Zhang, SFPUC, August 8, 2017.

Mitigation: None required.

Impact Conclusion for Proposed Access Program

The proposed access program along the Fifield-Cahill and southern skyline ridge trails would result in less-than-significant impacts related to interference with an adopted emergency response plan or emergency evacuation plan. No mitigation is required.

Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires. (Less than Significant with Mitigation)

Proposed Access Program (Docent Program on Fifield-Cahill Ridge Trail and Unsupervised/Restricted Access on Southern Skyline Ridge Trail)

As assessed in the management plan EIR, new and expanded public use of the watershed could increase the risk of fire hazards, including from unauthorized activity such as smoking and camping.[58] Under the proposed access program, access to the Fifield-Cahill ridge trail would be restricted and supervised by docent, and access to the southern skyline ridge trail would be unsupervised and restricted by permit. As explained in Chapter 2, Project Description (Section 2.7.1, Trail Access Management Program and Visitation), total annual visitation under the project would likely be somewhat less than 50,020 people per year, which represents the upper limit estimated for unsupervised/unrestricted visitation to project trails as identified in a recent visitor use study.[59]

The management plan EIR explains that the use of docents along the Fifield-Cahill ridge trail would help to control the types of unauthorized behaviors that could result in wildfires (e.g., smoking and camping).[60] The management plan EIR notes, however, that some wildfire risk would remain between Cemetery Gate and Skyline Quarry from accumulations of dead or dying Monterey cypress branches. The management plan EIR recommends Project-Level Mitigation Measure G.1.2, which calls for additional forest management in this area to reduce this impact. As noted in Impact HZ-7, above, the SFPUC has implemented this measure, which is an ongoing management activity within the watershed.[61] Notwithstanding the management of Monterey cypress forest, the management plan EIR concludes that this impact would be less than significant for docent-led access on the Fifield-Cahill ridge trail because trail users would be supervised and less likely to exhibit behaviors or engage in unauthorized activities that could result in wildfire.[62] As a result, consistent with the management plan EIR's conclusions and for the same reasons, project

58 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-11); Section V.G, Fire Management (pp. V-33 and V-34).

59 CHS Consulting Group, Memorandum from Jill Hough (CHS) to Elijah Davidian (Environmental Science Associates), re: Travel Demand and Vehicle Miles Traveled Estimates for Southern Skyline Boulevard Ridge Trail Extension, March 22, 2018.

60 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.G, Fire Management (p. V-34).

61 Fournet, John, Community Liaison, SFPUC, email correspondence to Yin Lan Zhang, SFPUC, August 8, 2017.

62 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.G, Fire Management (p. V-34).

operations on the Fifield-Cahill ridge trail under the proposed access program would not substantially increase the risk of loss, injury, or death involving wildland fires, resulting in a less-than-significant impact for this trail segment.

Under the project's proposed access program, visitation along the southern skyline ridge trail would be unsupervised and restricted to those with a permit. As part of this permit program, visitors would be required to complete an educational program with an emphasis on visitor rules and restrictions related to safety, including wildfire. As discussed in the management plan EIR, unsupervised public use of new trails could increase the potential for more of the types of unauthorized activities described above, which could increase fire hazards.[63] While most visitors would be expected to observe watershed rules (i.e., no smoking, no cooking stoves, no unauthorized off-trail use), a recently-completed land manager survey found that some amount of non-compliance with watershed rules is likely with unsupervised public access.[64] Due to the severity of fire hazard conditions near the project area, even a small number of visitors engaging in prohibited activities could increase wildfire risk, which would be a significant impact. The management plan EIR concludes that implementation of Program-Level Mitigation Measure G.2 would reduce indirect impacts of unsupervised access along the southern skyline ridge trail to a less-than-significant level.[65] This mitigation measure calls for implementation of the Peninsula Watershed Management Plan actions and policies that minimize the potential for adverse effects related to wildfire hazards.

Mitigation Measure M-HZ-8, Fire Management Plan, calls for the development and implementation of a new fire management plan, in coordination with CalFire, that incorporates the relevant requirements of the management plan EIR's Mitigation Measure G.2 that have yet to be implemented (see Section 4.11.1.3, Wildfires, *Peninsula Watershed Fire Management Element*). The fire management plan would include project-relevant and specific fire defense improvement actions, fuel management actions, and fire response actions from the Peninsula Watershed Management Plan. Implementation of these measures prior to and during project operation would substantially reduce the risk of fire. The majority of these actions would occur on property owned by and under the control of the City (under management by SFPUC). Implementation of a two actions (i.e., Actions fir4 and fir6) would require coordination with other non-City entities for improvements beyond the watershed – installing a wet hydrant along Pilarcitos Creek and improving vehicle access between Pacifica and watershed fire roads. However, these represent a small portion of the mitigation measure's extensive suite of fire management actions. Thus, the SFPUC's delay or inability to implement such actions would not substantially lessen the measure's overall effectiveness. For these reasons, with SFPUC's implementation of Mitigation Measure M-HZ-8, operation of the proposed access program along the southern skyline ridge trail would have a less-than-significant impact related to the risk of loss, injury, or death involving wildland fires.

63 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-11).
64 ESA+Orion, *Land Manager Survey – Southern Skyline Boulevard Ridge Trail Extension Project,* January 9, 2018.
65 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.G, Fire Management (p. IV-3).

Mitigation Measure M-HZ-8 applies to operation of the southern skyline ridge trail under the proposed access program.

Mitigation Measure M-HZ-8: Fire Management Plan.

The SFPUC shall prepare and implement a new fire management plan in coordination with CalFire prior to opening the southern skyline ridge trail, universal access loop trail, or Fifield-Cahill ridge trail to unsupervised public access. The new fire management plan shall include the actions of the fire management element of the Peninsula Watershed Management Plan relevant to the project and which have not been completed. Specifically, the new fire management plan shall include:

- Relevant fire defense improvement actions related to increasing the water supply for firefighting and constructing access improvements (Peninsula Watershed Management Plan fire defense improvement actions fir2, fir3, fir4, fir5, fir6, and fir7 – see expanded mitigation measure in Appendix E).
- Relevant fuel management actions related to reducing fuel volume and flammability, establishing/maintaining fuel discontinuity, and preventing fires from spreading to the tree crowns (Peninsula Watershed Management Plan fuel management action fir8 – see expanded mitigation measure in Appendix E).
- Relevant fire response actions that provide the framework for the SFPUC's response to fires (Peninsula Watershed Management Plan fire response actions fir9, fir10, fir11, fir12, and fir13 – see expanded mitigation measure in Appendix E).

If prescribed burns are proposed for fuel management, the fire management plan shall specify appropriate actions for safe implementation. These actions include preparing a prescription (or burn plan), coordinating with appropriate regulatory agencies regarding potential environmental impacts, obtaining a burn permit from the Bay Area Air Quality Management District, and notifying the public and neighboring agencies. The prescribed burn shall be conducted when conditions permit both adequate combustion and control of the fire and shall be coordinated with CalFire as part of its vegetation management program.

The new fire management plan shall address all of the identified fire management element actions and tailor those actions to site-specific conditions, as well as the potential effects of climate change. The plan's implementation methodology shall consider and incorporate, as relevant, the methods set forth in the Peninsula Watershed Management Plan's Appendix A-1 (Peninsula Watershed Fire Management Element). An implementation schedule shall be provided. The southern skyline ridge trail, universal access loop trail, and Fifield-Cahill ridge trail shall not be opened for unsupervised access until the actions intended to address fire risk in those areas have been completed. The SFPUC shall coordinate preparation and implementation of the fire management plan with CalFire as part of its fire prevention and vegetation management programs, in accordance with standing procedures and Peninsula Watershed Management Plan policy F9. Implementation of the fire management plan shall be assigned to an incident commander employed by the SFPUC's Natural Resources and Land Management Division in accordance with Peninsula Watershed Management Plan action fir13.

Access Program Variant 1 (Docent Program)

Under variant 1 (docent program), the potential for increased fire hazards would remain low because visitors to the Fifield-Cahill and southern skyline ridge trails would be supervised and therefore less likely to engage in the types of unauthorized behaviors that could result in wildfires (e.g., smoking and campfires).[66] As noted for the proposed access program, the management plan EIR concludes that impacts related to increased fire risks from docent-led access along the Fifield-Cahill ridge trail would be reduced to a less-than-significant level with implementation of Project-Level Mitigation Measure G.1. 2, which calls for forest management activities in the cypress forest north of Skyline Quarry to remove fire hazards posed by dead tree limbs.[67] As also noted previously, the SFPUC has implemented this measure, which is an ongoing management activity within the watershed. [68] Consistent with the management plan EIR conclusions and for the same reasons, project operation under variant 1 along Fifield-Cahill and southern skyline ridge trails would not substantially increase the risk of loss, injury, or death involving wildland fires, and this impact would be less than significant.

Mitigation: None required.

Access Program Variant 2 (Unsupervised/Unrestricted Access)

As discussed in the management plan EIR, unsupervised public use of new trails could increase the potential for greater incidence of the types of unauthorized activities described above, which could increase fire hazards.[69] While most visitors would be expected to observe watershed rules (i.e., no smoking, cooking stoves, no unauthorized off-trail use), a recently completed land manager survey found that some amount of non-compliance with watershed rules is likely with unsupervised public access.[70] Due to the severity of fire hazard conditions in the vicinity of the project area, even a small number of visitors engaging in prohibited activities could have substantial adverse effects related to wildfire risk, which would be a significant impact. As noted above, the management plan EIR concludes that impacts related to increased fire risks from unsupervised trail use would be reduced to a less-than-significant level with implementation of Program-Level Mitigation Measure G.2.[71] The management plan EIR also recommends implementation of Project-Level Mitigation Measure G.1. 2 which involves cypress forest management north of Skyline Quarry and has been implemented.[72,73] Implementation of Mitigation Measure M-HZ-8, Fire Management Plan, which incorporates relevant components of Mitigation Measure G.2, would substantially reduce the risk of fire by requiring development and implementation of a fire management plan in coordination with CalFire, including specific fire

66 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section V.G, Fire Management (p. V-34).
67 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.G, Fire Management (p. VI-5).
68 Fournet, John, Community Liaison, SFPUC, email correspondence to Yin Lan Zhang, SFPUC, August 8, 2017.
69 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.G, Fire Management (p. III.G-11).
70 ESA+Orion, *Land Manager Survey – Southern Skyline Boulevard Ridge Trail Extension Project,* January 9, 2018.
71 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.G, Fire Management (p. IV-3).
72 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section VI.G, Fire Management (p. VI-5).
73 Fournet, John, Community Liaison, SFPUC, email correspondence to Yin Lan Zhang, SFPUC, August 8, 2017.

defense and fuel management plan recommendations, among other measures. For these reasons, with SFPUC's implementation of Mitigation Measure M-HZ-8, variant 2 would have a less-than-significant impact related to the risk of loss, injury, or death involving wildland fires.

Mitigation Measure M-HZ-8 applies to operation of the project under access program variant 2.

Mitigation Measure M-HZ-8 – Fire Management Plan.

(See the proposed access program under Impact HZ-8, above, for a description of this mitigation measure.)

Access Program Variant 3 (Unsupervised/Restricted Access)

Under variant 3, with the addition of new trails and removal of barriers to access (e.g., reservations and docents), a substantial increase in visitation could result. However, given the additional permit and associated educational training requirement, the number of visitors would likely be reduced relative to variant 2. For the same reasons described for the southern skyline ridge trail under the proposed access program, implementation of variant 3 could result in increased unauthorized activities (e.g., smoking and camping), even with the permit and educational training, that could increase risk of fire within the watershed. As explained previously, due to the severity of fire hazard conditions in the vicinity of the project area, even a small number of visitors engaging in prohibited activities could have substantial adverse effects related to wildfire risk, which would be a significant impact. The management plan EIR concludes that implementation of Program-Level Mitigation Measure G.2 would reduce indirect impacts to a less-than-significant level for project access that provides unsupervised southern skyline ridge trail access.[74] This mitigation measure, which is reflected in Mitigation Measure M-HZ-8, Fire Management Plan, calls for implementation of specific Peninsula Watershed Management Plan actions that minimize the potential for adverse effects related to wildfire hazards. For the reasons described for the southern skyline ridge trail under the proposed access program above, SFPUC's implementation of Mitigation Measure M-HZ-8 would reduce the risk of fire associated with unsupervised access along the Fifield-Cahill and southern skyline ridge trails under variant 3 to a less-than-significant level.

Mitigation Measure M-HZ-8 applies to operation of the project under access program variant 3.

Mitigation Measure M-HZ-8 – Fire Management Plan.

(See the proposed access program under Impact HZ-8, above, for a description of this mitigation measure.)

Impact Conclusion for Proposed Access Program

Project operation under the proposed access program along the Fifield-Cahill ridge trail would not substantially increase the risk of loss, injury, or death involving wildland fires because trail users would be supervised and less likely to exhibit behaviors or engage in unauthorized activities that could result in wildfire, resulting in a less-than-significant impact for this trail segment. Project operation under the proposed access program along the southern skyline ridge

[74] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section IV.G, Fire Management (p. IV-3).

trail could result in significant impacts associated with the exposure of people or structures to substantial risk involving wildland fires. Implementation of Mitigation Measure M-HZ-8, Fire Management Plan, would reduce impacts associated with wildland fires to a less-than-significant level. For the reasons presented, with implementation of recommended mitigation, project operation under the proposed access program would have a less-than-significant impact related to wildland fires.

Impacts of Mitigation Measures

CEQA Guidelines section 15126.4 states that "if a mitigation measure would cause one or more significant effects in addition to those that would be caused by the project as proposed, the effects of the mitigation measure shall be discussed, but in less detail than the significant effects of the project as proposed." This section discusses potential effects associated with implementation of the fire management plan required by Mitigation Measure M-HZ-8, Fire Management Plan.

Implementation of the fire management plan's fire defense actions would involve installing five dry hydrants (action fir2), five helispots (action fir3), one wet hydrant (action fir 4), one water tank (action fir5), and constructing and modifying access routes for fire suppression (action fir6 and fir7). Similarly, implementation of the plan's fuel management actions would involve fuel reduction through measures such as forest thinning, tree trimming, vegetation mowing, grazing, and prescribed burns (action fir8). Implementation of these actions could result in substantial adverse effects on cultural and biological resources of the watershed.

Ground disturbance required for fire management plan implementation could result in inadvertent discoveries and disturbance to previously undiscovered archeological resources, human remains, and/or disrupt tribal cultural resources. As discussed in Sections 4.3, Cultural Resources and 4.12, Tribal Cultural Resources, such impacts would be significant. However, for the same reasons set forth in those sections' discussion of potential project construction impacts (Impacts CU-1, CU-2, and TCR-1), such effects could be avoided or minimized through mitigation. Specifically, implementation of mitigation measures M-CU-1 (Accidental Discovery of Archeological Resources and Human Remains) and M-TCR-1 (Tribal Cultural Resources Preservation Plan and/or Interpretive Program) would reduce these impacts to less-than-significant by requiring the SFPUC adhere to the appropriate procedures and protocols to identify and appropriately treating archeological resources discovered during construction activities, and by requiring the SFPUC to consider preservation in place of the resources and, if not feasible, implement additional actions including an interpretive program in consultation with the affiliated Native American tribal representatives.

Similarly, implementation of fire management plan actions involving ground and vegetation disturbance could adversely affect protected plants and animals, and/or their habitats. While SFPUC would implement its standard construction best management practices, and the impact avoidance and minimization measures for wetlands, plant pathogens, and vegetation maintenance identified Chapter 2, Project Description, some of these activities could result in substantial secondary effects related to candidate, sensitive, or special-status plant species; candidate, sensitive, or special-status wildlife species; sensitive natural communities; and spread

of plant pathogens. As discussed in Section 4.8, Biological Resources, such impacts could be significant.

Special-status plant and animal species and sensitive natural communities could be adversely affected by the fire defense and fuel management actions involving use of heavy equipment, ground disturbance, and vegetation removal (e.g., forest thinning, tree trimming, vegetation mowing, prescribed burns). However, for the same reasons set forth in the biological resources section's discussion of potential project construction and operation impacts on special-status plant species and sensitive natural communities (Impacts BI-1, BI-3, and BI-4), such effects could be avoided or minimized through mitigation. Specifically, implementation of mitigation measures M-BI-1a (Avoidance Measures for Special-status Plant Species), M-BI-1b (Minimization Measures for Special-status Plant Species and their Habitat), M-BI-1c (Revegetation Plan), M-BI-1d (Worker Environmental Training), M-BI-3 (Minimizing, Monitoring, and Compensatory Replacement for Impacts on Sensitive Natural Communities), and M-BI-4 (Operational Measures to Protect Sensitive Plant Species) would reduce these impacts to a less-than-significant level by requiring appropriately timed and located special-status plant and sensitive natural community surveys; avoidance of special-status plants and sensitive natural communities, if present; minimization measures to reduce the project footprint; measures to reduce the spread of invasive plants; revegetation of temporarily affected habitat; the establishment of protective buffers; ongoing monitoring to detect changes in special-status plant populations near fire management mitigation activities; evaluation of whether fire management mitigation activities contributes to special-status plant population decline; and relocation of the work area so that any sensitive natural communities are avoided to the extent feasible.

Similarly, special-status animal species could be adversely affected by fire management plan actions, including those described previously for special-status plant and sensitive natural communities. However, for the same reasons set forth in the biological resources section's discussion of potential project construction impacts on special-status animal species (Impacts BI-2), such effects could be avoided or minimized through mitigation. Specifically, implementation of mitigation measures M-BI-1c (Revegetation Plan), M-BI-1d (Worker Environmental Training), M-BI-2a (Avoidance and Minimization Measures for Special-status Reptiles and Amphibians), M-BI-2b (Avoidance and Mitigation for Host Plants of Listed Butterfly Species), M-BI-2c (Avoidance and Minimization Measures for Dusky-Footed Woodrat and American Badger), M-BI-2d (Measures to Minimize Disturbance to Nesting Bird Species), and M-BI-2e (Avoidance and Mitigation Measures for Special-status Bats and Maternity Roosts) would reduce these impacts to a less-than-significant level by requiring restoration of temporarily affected habitat; worker environmental training; wildlife exclusion from work zones; biological monitoring during work; preconstruction butterfly larval host plant surveys and flagging of host plants so that workers avoid them; preconstruction surveys for woodrat nests and badger dens and avoidance or relocation of nests and avoidance of dens; and preconstruction surveys and avoidance of active bird nest and bat roost areas with a suitable buffer, and performance of bat-sensitive tree trimming.

Implementation of the fire management actions could result in the spread of invasive plant species and plant pathogens due to transport and spread of invasive weeds and pathogens on

equipment, personnel, and vehicles. However, for the same reasons set forth in the biological resources section's discussion of invasive plant species and pathogens impacts (Impact BI-7), such effects could be avoided or minimized through mitigation. Specifically, implementation of mitigation measures M-BI-4 (Operational Measures to Protect Sensitive Plant Species), M-BI-7a (Measures to Reduce Spread of Invasive Plants) and M-BI-7b (Measures to Limit the Spread of Phytophthora spp. [including Sudden Oak Death]) would reduce these impacts to a less-than-significant level. The invasive plant species and plant pathogen mitigation measures would require equipment to be cleaned and free of invasive weed seeds; restrictions on the types of fill and erosion control materials allowed; development and implementation of an invasive plant management plan that includes invasive plant surveys and removal; educational signage and sanitation procedures for personnel entering and leaving each portion of the work area. In addition, as discussed in the Section 4.8, Biological Resources, the SFPUC would include in its construction contract specifications measures to control the spread of pathogens, including worker training; cleaning and sanitation of vehicles, equipment, footwear, and tools prior to entering and leaving work sites; minimizing the movement of soil and plant material within work sites; and restrictions on the import of construction materials, including soil and plant materials (see Appendix D).

Cumulative Impacts

Impact C-HZ-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts related to hazards and hazardous materials. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis used throughout this EIR and summarizes cumulative projects in the vicinity of the project. The hazards and hazardous materials project impacts would include the use of hazardous materials during construction and the potential to encounter hazardous materials or naturally occurring asbestos in the soil. The geographic scope of these cumulative impacts is restricted to the immediate area of the locations where project construction would occur. The geographic scope for interference with emergency response and wildfire hazards includes the entire Peninsula Watershed.

None of the potentially cumulative projects listed in Table 4.1-1 would be located adjacent to locations where project construction would occur; therefore, there would be no cumulative impacts related to the use of hazardous materials during construction or the potential to encounter hazardous materials or naturally occurring asbestos in soil (discussed in impacts HZ-1, HZ-2, and HZ-3). Further, none of the cumulative projects would affect the same roadways as the project; as a result, there would be no significant cumulative impact related to interference with emergency response during construction (discussed in Impact HZ-4).

Some of these cumulative projects could increase fire risks during construction, which would be a significant cumulative impact. However, with implementation of mitigation requiring compliance with the appropriate sections of the California Public Resources Code **(**discussed in

Impact HZ-5), the project would have no notable residual effect that could result in a cumulatively considerable contribution to increased fire hazards during construction.

None of the projects listed in Table 4.1-1 would result in a permanent change in operations within the watershed. Therefore, there would be no significant cumulative impact related to the potential to encounter hazardous materials in the soil, interference with emergency response, or wildland fire hazards during project operation (discussed in Impacts HZ-6, HZ-7, and HZ-8).

Mitigation: None required.

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4.12 Tribal Cultural Resources

This section describes the existing setting for tribal cultural resources in the project area and evaluates the potential impacts on these resources associated with implementation of the Southern Skyline Boulevard Ridge Trail Extension Project ("project"). The analysis addresses potential effects from construction and operation of the project with the proposed access program (docent program along Fifield-Cahill ridge trail and unsupervised/restricted access along southern skyline ridge trail) and under variant 1 (docent program), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access). *Tribal cultural resources* are sites, features, places, and objects with cultural value to descendant Native American communities. Affected communities may consider certain archeological sites of Native American origin to be tribal cultural resources. Based on AB 52 consultation in 2015, the city of San Francisco considers all archeological resources of Native American origin, including all prehistoric resources, to be potential tribal cultural resources. This section incorporates information from Section 4.3, Cultural Resources, related to the environmental setting, regulatory context and environmental impact analysis.

Of the comments received during the public scoping period, comments on tribal cultural resources generally concern requests or recommendations to conduct the following: a cultural resources technical study; an archeological field survey; consultation with relevant Native American tribes, groups, and individuals; and consultation with the National Trust for Historic Preservation. Sections 4.12.1, Environmental Setting, and 4.12.3, Impacts and Mitigation Measures, address these comments.

4.12.1 Environmental Setting

Section 4.3 provides a discussion of the CEQA Area of Potential Effects (C-APE) as it relates to cultural resources and tribal cultural resources; background context including a prehistoric, ethnographic, and historical background; and the results of a cultural resources analysis for the C-APE. No tribal cultural resources or archeological resources that could potentially be considered tribal cultural resources are in the C-APE.

As described in Section 4.3, the C-APE has a low sensitivity to contain prehistoric archeological resources, and the project has a low potential to uncover prehistoric archeological resources because: (1) much of the alignment is located on steep terrain that prehistoric inhabitants would not have likely occupied or settled; (2) the potential is low for human burial sites to be present beneath sediments along most of the alignment because of the relatively steep depositional setting; (3) no prehistoric archeological resources were identified despite intensive survey of 75 percent of the C-APE, which covered all areas that were accessible/level; and (4) project construction and future operations would involve relatively small areas of ground disturbance.

On June 21, 2016, AECOM contacted the Native American Heritage Commission (heritage commission) in Sacramento, requesting a review of their Sacred Lands File for any Native American cultural resources that might be affected by the project. A list of names of local Native American groups and/or individuals who might have information or concerns about the C-APE

was also requested. The heritage commission responded on July 6, 2016 stating that a review of the Sacred Lands File was completed for the C-APE with negative results. The heritage commission also provided a list of five Native American contacts who might have an interest in the project vicinity.

On July 29, 2016, AECOM sent letters describing the project to each Native American individual identified by the heritage commission, requesting any information or concerns they might have regarding cultural resources in the vicinity of the C-APE. On August 4, 2016, Irenne Zwierlein, Chairperson, Amah Mutsun Tribal Band of Mission San Juan Bautista, contacted Brett Rushing, California Department of Transportation (Caltrans) District 4 Native American Coordinator, and Mark Hale, AECOM Senior Project Archeologist, with concerns that the C-APE was located within the boundary of the Bourn-Roth (Filoli) Estate, as a prehistoric archeological resource is located within the boundary of that property. Mr. Hale responded to Ms. Zwierlein on August 5, 2016. Mr. Hale thanked Ms. Zwierlein for her response and noted that AECOM is aware that a portion of the C-APE is within the southwestern extent of the Bourn-Roth Estate property boundary, but that the prehistoric resource of concern is more than 1 mile from the C-APE. Ms. Zwierlein responded on August 6, 2016, requesting that both archeological and Native American monitors be present during project construction.

On November 11, 2016, AECOM made follow-up telephone calls to all five of the Native American individuals listed by the heritage commission. A summary of these efforts is documented below:

- ***Irenne Zwierlein, Chairperson, Amah Mutsun Tribal Band***: AECOM left a voicemail message for Ms. Zwierlein.
- ***Tony Cerda, Chairperson, Costanoan Rumsen Carmel Tribe*****:** AECOM telephoned Mr. Cerda; the phone was not answered and there was no voicemail/answering machine, so no message was left.
- ***Ann Marie Sayers, Chairperson, Indian Canyon Mutsun Band of Costanoan*****:** AECOM spoke with Ms. Sayers, who said she would like to be notified immediately if any cultural material and/or human remains are unearthed during project-related activities.
- ***Rosemary Cambra, Chairperson, Muwekma Ohlone Indian Tribe of the San Francisco Bay Area*****:** AECOM spoke with Ms. Cambra. Ms. Cambra said she believed that the C-APE was within a sensitive area and recommended that a Muwekma Ohlone monitor be present during project-related earth-disturbing activities. Furthermore, Ms. Cambra requested that if and/or when human remains are identified within the C-APE that a Muwekma Ohlone be designated the Most Likely Descendent and remove the burial.
- ***Andrew Galvan, The Ohlone Indian Trib*****e:** AECOM telephoned Mr. Galvan and reached his voicemail; however, the voicemail box was full and no message could be left.

On December 20, 2016, Environmental Science Associates contacted the heritage commission by email with an attachment to request a records search of their Sacred Lands File and a list of Native American representatives with cultural affiliation to the C-APE and vicinity. Environmental Science Associates received a response from the heritage commission on December 27, 2016 stating that the Sacred Lands File has no record of any tribal cultural resources in the C-APE. The reply also included a list of four Native American representatives affiliated with the C-APE for consultation on tribal cultural resources.

On April 26, 2017, the San Francisco Planning Department sent additional notices to 11 representatives of local Native American tribes, pursuant to Public Resources Code section 21080.3.1, regarding tribal cultural resources. No responses have been received.

4.12.2 Regulatory Framework

4.12.2.1 Federal Regulations

Historical and archeological resources, including tribal cultural properties, are considered through the National Historic Preservation Act of 1966, as amended (54 United States Code 306108), and its implementing regulations. Before an "undertaking" (e.g., federal funding or issuance of a federal permit) is implemented, section 106 of the preservation act requires federal agencies to consider the effects of the undertaking on historic properties (i.e., properties listed in or eligible for listing in the National Register) and to afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on any undertaking that would adversely affect properties eligible for listing in the National Register. Under the preservation act, a property is considered significant if it meets the National Register listing criteria A through D, at 36 Code of Federal Regulations 60.4, as follows:

> The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and that:
>
> A. Are associated with events that have made a significant contribution to the broad patterns of our history, or
>
> B. Are associated with the lives of persons significant in our past, or
>
> C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction, or
>
> D. Have yielded, or may be likely to yield, information important in prehistory or history.

For a resource to be eligible for the National Register, it must also retain enough integrity to be recognizable as a historic property and to convey its significance. Resources that are less than 50 years old are generally not considered eligible for the National Register.

Federal review of the effects of undertakings on significant cultural resources is carried out under section 106 of the National Historic Preservation Act and is often referred to as "section 106 review." This process is the responsibility of the federal lead agency. The section 106 review typically involves a four-step procedure, which is described in detail in the implementing regulations of the preservation act (36 Code of Federal Regulations 800):

- Define the Area of Potential Effects in which an undertaking could directly or indirectly affect historic properties,
- Identify historic properties in consultation with the State Historic Preservation Office and interested parties,

- Assess the significance of effects of the undertaking on historic properties, and
- Consult with the State Historic Preservation Officer, other agencies, and interested parties to develop an agreement that addresses the treatment of historic properties, notify the Advisory Council on Historic Preservation, and proceed with the project according to the conditions of the agreement.

4.12.2.2 State Regulations

Public Resources Code sections 21074 and 21083

In September of 2014, the California Legislature passed Assembly Bill 52, which added provisions to the Public Resources Code regarding the evaluation of impacts on tribal cultural resources under CEQA, and consultation requirements with California Native American tribes. In particular, Assembly Bill 52 now requires lead agencies to analyze project impacts on tribal cultural resources separately from archeological resources (Public Resources Code sections 21074 and 21083.09). The bill defines tribal cultural resources in a new section of the Public Resources Code (section 21074). Assembly Bill 52 also requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (Public Resources Code sections 21080.3.1, 21080.3.2, 21082.3).

Specifically, Public Resources Code section 21084.3 states:

a) Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.

b) If the lead agency determines that a project may cause a substantial adverse change to a tribal cultural resource, and measures are not otherwise identified in the consultation process provided in section 21080.3.2, the following are examples of mitigation measures that, if feasible, may be considered to avoid or minimize the significant adverse impacts:

    1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria

    2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

        (A) Protecting the cultural character and integrity of the resource

        (B) Protecting the traditional use of the resource

        (C) Protecting the confidentiality of the resource

    3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places

    4) Protecting the resource

Finally, Assembly Bill 52 required the Office of Planning and Research to update Appendix G of the CEQA Guidelines to provide sample questions regarding impacts on tribal cultural resources (Public Resources Code section 21083.09). Additionally, the San Francisco Planning Department has

formulated significance criteria specific to San Francisco-related projects, which are used in this EIR. Assembly Bill 52 applies to those projects for which a lead agency has issued a notice of preparation of an EIR or notice of intent to adopt a negative declaration on or after July 1, 2015. As described above in section 4.12.1, Environmental Setting, the San Francisco Planning Department, as the CEQA lead agency for this project, has carried out Native American consultation consistent with the requirements of Assembly Bill 52.

4.12.2.3 Local Regulations

There are no local regulations related to tribal cultural resources that apply to this project.

4.12.3 Impacts and Mitigation Measures

4.12.3.1 Significance Criteria

The project would have a significant effect on tribal cultural resources if it were to:

- Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.

4.12.3.2 Approach to Analysis

This analysis considers both construction and operational impacts associated with the project. While most impacts on tribal cultural resources tend to occur during the construction phase of a project, there is a potential for project operations to affect these types of resources. For example, project maintenance and increased public access could affect archeological resources as well as non-archeological tribal cultural resources (e.g., sacred places such mountain peaks, large rock outcrops, etc.) through general increases in trail use and management activities that could impinge on the setting or cause deterioration over time.

Tribal Cultural Resources

Public Resources Code section 21074(a) defines a tribal cultural resource as a site, feature, place, cultural landscape, sacred place, or object of cultural value to a California Native American tribe that is either listed in or eligible for the California Register or a local historic register, or any such resource that the lead agency, at its discretion, chooses to treat as a tribal cultural resource. Cultural landscapes that meet the above criteria may also be tribal cultural resources if they are geographically defined in terms of size and scope. A historical resource, unique archeological resource, or non-unique archeological resource may also be a tribal cultural resource if it meets the above criteria. This EIR assessment of impacts on tribal cultural resources was performed in consultation with affiliated Native American Tribes and in accordance with Public Resources Code section 21080.3. This impact analysis considers whether the project would cause damaging effects to any tribal cultural resource, including prehistoric archeological resources that could also be considered tribal cultural resources.

Cumulative Impacts

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach used in this EIR to conduct the cumulative analysis; refer to Table 4.1-1 and Figure 4.1-1 for descriptions and locations of potential cumulative projects near the project area. The cumulative analysis for tribal cultural resources uses a list-based approach to analyze the effects of the project in combination with past, present, and probable future projects in the C-APE. Similar to the analysis for project impacts, the cumulative impact analysis assumes that other projects in the C-APE would be constructed and operated in compliance with design standards, applicable permits, and environmental review requirements, and, where warranted, would incorporate mitigation for any impacts on tribal cultural resources to avoid and/or reduce impacts on a project-by-project basis.

The cumulative analysis considers whether the effects of project implementation, in combination with the effects of other proximate past, present, and probable future projects, would result in a significant, adverse cumulative impact on tribal cultural resources, and, if so, whether the project's contribution to the cumulative impact would be considerable. Both conditions—the effects of project implementation and the project's contribution to the cumulative impact—must apply in order for a project's contribution to cumulative effects to be deemed cumulatively considerable (significant). If effects are deemed significant, then mitigation measures are identified to reduce the project's contribution to the extent feasible.

4.12.3.3 Impact Summary

Table 4.12-1 summarizes the impacts of the project related to tribal cultural resources. The impact summary table provides separate significance determinations for the proposed access program, access program variant 1 (docent program), access program variant 2 (unsupervised/unrestricted access), and access program variant 3 (unsupervised/restricted access).

TABLE 4.12-1
SUMMARY OF IMPACTS –TRIBAL CULTURAL RESOURCES

Impacts	Significance Determinations			
	Proposed Access Program	**Access Program Variant 1 (Docent Program)**	**Access Program Variant 2 (Unsupervised/ Unrestricted Access)**	**Access Program Variant 3 (Unsupervised/ Restricted Access)**
Impact TCR-1: Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	LSM	LSM	LSM	LSM
Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	LSM	LSM	LSM	LSM
Impact C-TCR-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on tribal cultural resources.	LS	LS	LS	LS

LS = Less than Significant impact, no mitigation required
LSM = Less than Significant impact with Mitigation

4.12.3.4 Impact Analysis

The impact discussions presented below evaluate potential project impacts related to the above significance criteria.

As discussed in Chapter 2, Project Description, ground disturbance associated with project construction and operation would vary among the proposed access program and the access program variants under consideration. For example, under the proposed access program and variant 1, the SFPUC would not construct new barbed-wire fencing along the Fifield-Cahill ridge trail between Cemetery Gate and Portola Gate, but would install fencing along the trail under access program variants 2 and 3. Thus, variants 2 and 3 would involve ground disturbance along the fenceline while the proposed access program and variant 1 would not. Similarly, under the proposed access program and variant 1, project visitation would be supervised and would be capped at 24,960; under access program variants 2 and 3, the number of visitors could be as high as double that number. Despite this variation, the potential is low for sensitive tribal cultural resources to be present within the C-APE, for the reasons described in Section 4.12.1, Environmental Setting; therefore, the potential effects on tribal cultural resources would be substantially similar for the proposed access program and the variants, with some additional ground disturbance under variants 2 and 3 for the construction of fencing. Therefore, the impact evaluations below combine the discussions for the proposed access program and the variants.

Construction Impacts

Impact TCR-1: Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074. (Less than Significant with Mitigation)

Based on the background research and survey efforts completed by AECOM and Environmental Science Associates, as well as communication with Native American groups, there is no indication of tribal cultural resources or other remaining evidence of past human use and occupation in the C-APE. No Native American representatives have requested consultation on tribal cultural resources for the project. As discussed above in section 4.12.1, Native American representatives responded with concerns that the area may be archeologically sensitive and at least one requested that a Native American monitor be included; however, monitoring does not appear be warranted based on archeological survey results and modeling. Based on the Native American communication completed for the project, discussed above in Section 4.12.1, Native American representatives would be contacted in the event of an inadvertent discovery.

While the potential appears low for project construction activities to uncover archeological resources that could be considered tribal cultural resources, the possibility of accidental discovery of archeological resources during project construction (including the proposed access program and variants) cannot be entirely discounted. Thus, the potential for project-related construction activities to affect tribal cultural resources is considered significant. As discussed in Section 4.3, Cultural Resources (Impact CU-1), during construction, Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits by requiring the

SFPUC and its contractors to adhere to the appropriate procedures and protocols to identify and appropriately treat archeological resources discovered during construction activities. If the archeological consultant called for under M-CU-1 determines that the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance, the resource may constitute a tribal cultural resource. In the event of such determination, the SFPUC shall implement the measures called for under Mitigation Measure M-TCR-1.

Mitigation Measure M-TCR-1, Tribal Cultural Resources Preservation Plan and/or Interpretive Program, would address construction impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits considered to be tribal cultural resources by requiring the SFPUC to consider preservation in place of the resources and, if not feasible, implement additional actions including archeological data recovery and an interpretive program in consultation with the affiliated Native American tribal representatives. Implementation of this mitigation measure in the event of the discovery of a potential tribal cultural resource would reduce the impact to a less-than-significant level.

Mitigation Measure M-TCR-1 applies to construction of all project components under the proposed access program and variants.

Mitigation Measure M-TCR-1 – Tribal Cultural Resources Preservation Plan and/or Interpretive Program.

If the archeological consultant called for under M-CU-1 determines that the accidental discovery is an archeological resource of Native American origin, retains sufficient integrity, and is of potential scientific/historical/cultural significance, Mitigation Measure M-TCR-1 shall be implemented.

In the event of the discovery of an archeological resource of Native American origin, the Environmental Review Officer (ERO), the project sponsor, and the tribal representative, shall consult to determine whether preservation in place would be feasible and effective. If it is determined that preservation-in-place of the tribal cultural resource would be both feasible and effective, then the archeological consultant shall prepare an archeological resource preservation plan, which shall be implemented by the project sponsor during construction. If the ERO in consultation with the project sponsor and the tribal representative determines that preservation–in-place of the tribal cultural resource is not a sufficient or feasible option, then the project sponsor shall prepare an interpretive program of the tribal cultural resource in consultation with affiliated Native American tribal representatives. The plan shall identify proposed locations for installations or displays, the proposed content and materials of those displays or installation, the producers or artists of the displays or installation, and a long-term maintenance program. The interpretive program may include artist installations, preferably by local Native American artists, oral histories with local Native Americans, artifacts displays and interpretation, and educational panels or other informational displays. Upon approval by the ERO and prior to project occupancy, the interpretive program shall be prepared by the project sponsor.

Impact Conclusion for Proposed Access Program

Construction of the project with the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail could result in a significant impact by causing inadvertent damage to tribal cultural resources and thus an adverse change in the significance of the resources. However, implementation during construction of Mitigation Measure M-TCR-1, Tribal Cultural Resources Preservation Plan and/or Interpretive Program, would reduce the potential impact on tribal cultural resources to a less-than-significant level through preservation in place or archeological data recovery and interpretation. For the reasons presented in the impact analysis, construction of the project with the proposed access program would have a less-than-significant impact on tribal cultural resources with implementation of the recommended mitigation.

Operational Impacts

Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074. (Less than Significant with Mitigation)

Based on the background research and survey efforts completed by AECOM and Environmental Science Associates, as well as communication with Native American groups, there is no indication of tribal cultural resources or other remaining evidence of past human use and occupation in the C-APE. Accordingly, for the same reasons presented in Impact CU-2 (i.e., low potential for presence, minimal ground disturbance, proposed security measures), the potential would be low for project-related operations activities, including public access under the proposed access program and variants, to adversely affect tribal cultural resources. While there appears to be a low potential for project operation activities to uncover archeological resources that could be considered tribal cultural resources, accidental discovery of archeological resources during project operations (including the proposed access program and variants) cannot be entirely discounted. Thus, the potential for project-related operational activities to affect tribal cultural resources is considered significant. As discussed in Section 4.3, Cultural Resources (Impact CU-3), during operations, Mitigation Measure M-CU-1, Accidental Discovery of Archeological Resources and Human Remains, would address impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits by requiring the SFPUC and its contractors to adhere to the appropriate procedures and protocols to identify and appropriately treat archeological resources discovered during operational activities. If the archeological consultant called for under M-CU-1 determines the discovery is an archeological resource, retains sufficient integrity, and is of potential scientific/historical/cultural significance, the SFPUC shall implement the measures called for under Mitigation Measure M-TCR-1.

Mitigation Measure M-TCR-1, Tribal Cultural Resources Preservation Plan and/or Interpretive Program, would address operations impacts on any previously unrecorded and buried (or otherwise obscured) archeological deposits, including those considered to be tribal cultural resources. The measure would require the SFPUC to consider preservation in place of the resources and, if not feasible, implement additional actions including an interpretive program in

consultation with the affiliated Native American tribal representatives. Implementation of this mitigation measure in the event of the discovery of potential tribal cultural resources would reduce the potential impact to a less-than-significant level.

> *Mitigation Measure M-TCR-1 applies to operation of all project components under the proposed access program and variants.*
>
> **Mitigation Measure M-TCR-1, Tribal Cultural Resources Preservation Plan and/or Interpretive Program.**
>
> (See Impact TCR-1, above, for a description of the mitigation measure.)

Impact Conclusion for Proposed Access Program

Operation of the project under the proposed access program along both the Fifield-Cahill ridge trail and the southern skyline ridge trail has a low, but not entirely discountable, potential to significantly affect tribal cultural resources by causing inadvertent damage to and thus an adverse change in the significance of such resources. However, implementation of Mitigation Measure M-TCR-1, Tribal Cultural Resources Preservation Plan and/or Interpretive Program, would reduce potential impacts on tribal cultural resources to a less-than-significant level through preservation in place or other appropriate measures. For the reasons presented in the analysis, operation of the project with the proposed access program would have a less-than-significant impact on tribal cultural resources with implementation of the recommended mitigation.

Cumulative Impacts

Impact C-TCR-1: The project, in combination with past, present, and probable future projects, would not substantially contribute to cumulative impacts on tribal cultural resources. (Less than Significant)

Section 4.1.4, Cumulative Impact Analysis, describes the overall approach to the cumulative analysis employed throughout this EIR and summarizes the cumulative projects in the vicinity of the project; the cumulative impacts portion of Section 4.12.3.2, *Approach to Analysis*, provides additional details on the approach to cumulative analysis performed herein. The geographic scope for cumulative effects on tribal cultural resources consists of the project C-APE. The cumulative analysis considers the additive effect of potential project impacts on: tribal cultural resources that qualify as historical resources, as defined in CEQA Guidelines section 15064.5; and tribal cultural resources, as defined in Public Resources Code section 21074. The project would result in a cumulatively considerable (significant) impact if project impacts after mitigation, combined with the impacts of one or more cumulative projects, were to cause a substantial adverse effect on the same tribal cultural resource.

Federal, state, and local laws protect archeological resources, including those considered tribal cultural resources, in most instances. Even so, it is not always feasible to entirely avoid archeological sites or retain them in situ. Because all significant tribal cultural resources are unique and nonrenewable members of finite classes, any adverse effects or negative impacts erode a dwindling resource base.

The project would not affect any known tribal cultural resources. As a result, significant cumulative impacts on tribal cultural resources would not occur.

Mitigation: None required.

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4.13 Topics Not Requiring Detailed Environmental Analysis

The Peninsula Watershed Management Plan EIR evaluates the environmental effects of new recreational trails and amenities, along with a range of public access program options for watershed trails. The analysis considers many of the components of the project, albeit at a more general, or program level, of analysis. Since certification of the management plan EIR, the SFPUC has developed additional site-specific and project-level information that allow for a more detailed review of the project's potential impacts. Sections 4.2 through 4.12 of this EIR address topics for which either the management plan EIR or subsequent project-level analysis as part of this EIR found the project components could have a significant impact. This section addresses topics for which the management plan EIR and/or subsequent project-level analysis as part of this EIR found the project components would not have a significant impact. Each subsection below explains why the project would have either no impact or a less-than-significant impact with respect to those topics.

4.13.1 Land Use

The management plan EIR concludes that the establishment of new trails and amenities, along with expanded public access, would not have a significant impact on land use.[1] The project would not divide an established community because the project would be limited to the Peninsula Watershed, where there is no established community. As discussed in Chapter 3, Plans and Policies, the project would not, on balance, conflict with applicable general or regional plans, nor would it conflict with other applicable land use policies or regulations adopted for the purpose of avoiding or mitigating an environmental effect. As such, the project would not conflict with an applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating environmental impacts. The respective topical sections of this document address potential conflicts with other environmental topic-specific plans, policies, or regulations. The project, which involves construction of recreational trails and amenities within a mostly natural setting, would not have a substantial impact on the existing character of the vicinity because the Peninsula Watershed and vicinity presently contain recreational trails and amenities and would remain mostly natural with implementation of the project. Overall, for these reasons, the project would have a less-than-significant impact related to land use and land use planning.

4.13.2 Population and Housing

The management plan EIR concludes that the establishment of new trails and amenities, along with expanded public access, would not foster economic growth or the construction of additional housing, either directly or indirectly.[2] The project would not directly or indirectly induce population growth because it would not create new housing or construct new infrastructure that

[1] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section I, Summary (pp, I-5, I-7, I-9, and I-11), File No. 96.22E; State Clearinghouse No. 98082030, certified January 11, 2001, *www.sfwater.org/Modules/ShowDocument.aspx?documentID=4343,* accessed May 18, 2018.

[2] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.O, Growth Inducement (p. III.O-1).

would enable the development of new housing. As discussed in Chapter 2, Project Description, Table 2-1, it is expected that the project would require up to 20 workers per day during the 12-month construction period, and up to one additional staff person and up to 10 trained volunteers for project operations, and that this labor requirement could be satisfied from the local labor supply. Moreover, given the small number of employees required, coupled with the short duration of the construction-period, the project would not cause large numbers of people to move to the region because of project employment opportunities. Accordingly, the project would not cause substantial population growth in the area, nor would it displace substantial numbers of existing housing units or create demand for new housing. For these reasons, the project would have a less-than-significant impact related to population and housing.

4.13.3 Wind and Shadow

The project would not alter wind or create new shadows in a way that would affect outdoor recreation facilities or other public areas. The proposed vault toilets are the only new vertical structures proposed. These restrooms would be enclosed in small buildings and constructed in remote locations, distant from other vertical developments. The SFPUC would install two of the restrooms in a forested area along the southern skyline ridge trail alignment, which is presently shaded by trees that are taller than the proposed restroom structure, and the other one in an open area adjacent to a proposed 50-car parking lot along the Fifield-Cahill ridge trail. None of the structures would be tall or massive enough to substantially alter wind patterns or create substantial shading of outdoor recreational facilities or public areas. For these reasons, the project would have a less-than-significant impact related to wind and shadow.

4.13.4 Recreation

The project is a recreational project, the implementation of which could cause adverse physical effects on the environment. The impacts that could result from project construction and operation are addressed in the corresponding topical sections of this EIR (i.e., Sections 4.2 through 4.12). However, as discussed below, construction and operation of the project is not expected to have substantial adverse effects related to increased use of nearby parks or facilities such that deterioration or degradation would occur.

As noted in Chapter 2, Project Description, existing Fifield-Cahill ridge trail access under the docent program could be restricted during the 12-month construction period. During this time, some potential users may choose to visit alternative recreational destinations in the region. Given the small number of existing visitors under the docent program (i.e., approximately 1,000 per year), combined with the substantial number of alternative recreational opportunities in the region (e.g., Crystal Springs Regional Trail, Sweeney Ridge Trail, Purisima Creek Redwoods Open Space Preserve, Huddart Park, and San Pedro Valley Park, among others), any increase in visitation among regional parks as a result of displaced Fifield-Cahill ridge trail users would be negligible.

Under the proposed access program and access program variant 2 (unsupervised/unrestricted access) and variant 3 (unsupervised/restricted access), watershed visitation is expected to increase. Comparatively, access program variant 1 (docent program) is expected to experience a

more modest increase in visitation. However, nearby parks would not experience notable increases in visitation because the project is unlikely to generate a large number of new recreationists in the region; many of the new trail visitors would likely be current recreationists who otherwise would have visited another park or trail in the region. Since the proposed access program and variants are not expected to attract large numbers of visitors who would use other recreational facilities in the region, nearby parks would not experience notable increases in visitation. Thus, the project could result in a slight reduction in use of similar nearby recreational areas and facilities.

Under the proposed access program and variants, watershed visitors would be able to access the Sweeney Ridge Trail to the north via Portola Gate. However, visitors to the Purisima Creek Redwoods Open Space Preserve to the south would need to use State Route 35 (S.R. 35), as the project does not provide a trail connection between the southern skyline ridge trail and this open space preserve. It is expected that some visitors would travel from the project area onto adjacent publicly accessible recreational lands (e.g., Sweeney Ridge Trail). However, given the distance between the SFPUC's designated project parking areas (i.e., one parking lot approximately 1.5 miles north of S.R. 92 and another parking lot south of the S.R. 92/S.R. 35 intersection) and these adjacent recreational lands (i.e., approximately 6 to 8 miles), only a small number of visitors are expected to travel from the project site to these other areas. While the southern skyline ridge trail would extend to the watershed's boundary with the Phleger Estate, the estate could not be accessed because no trail exists beyond the watershed limits. Until a trail is constructed over the Phleger Estate property, or a connection is provided across S.R. 35 to Purisima Creek Redwoods Open Space Preserve, southern skyline ridge trail users would be required to turn around at the terminus of the trail and return via the same path.

For the reasons described above, the project would have a less-than-significant effect related to increased use of nearby parks or facilities.

4.13.5 Utilities and Service Systems

The management plan EIR concludes that the establishment of new trails and amenities, along with expanded public access, would not have a significant impact on utilities.[3] The project does not involve the provision of water and thus would have no impact related to the availability of water supply to serve the project. Section 4.10, Hydrology and Water Quality, discusses potential impacts on stormwater drainage facilities.

Based on anticipated trail demand, vault toilets are expected to generate a maximum of approximately 10,045 total gallons of waste annually. Waste would be disposed at either San Francisco's Oceanside Treatment Plant, which has capacity to treat 65 million gallons per day during rain events,[4] or at the Southeast Treatment Plant, which has capacity to treat 250 million gallons per day during rain events.[5] The project would not cause a wastewater treatment facility

[3] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section I, Summary (pp., I-5, I-7, I-9, and I-11).

[4] San Francisco Public Utilities Commission, *Oceanside Treatment Plant*, 2017, *https://sfwater.org/index.aspx?page=622,* accessed April 6, 2017.

[5] San Francisco Public Utilities Commission, *Southeast Treatment Plant*, 2017, *https://sfwater.org/index.aspx?page=616,* accessed April 6, 2017.

to exceed the treatment requirements of the Regional Water Quality Control Board; the vault toilet waste would not differ from the type of waste that municipal wastewater treatment facilities regularly accept. The project does not propose the construction of new or the expansion of existing water or wastewater treatment facilities, nor would it cause a wastewater treatment facility to exceed its capacity to serve projected demand; the volume increase would be negligible relative to the treatment system's service area and capacity.

As noted in Chapter 2, Project Description, the project could require the disposal of up to 8,000 cubic yards of soil and construction waste at the Ox Mountain Sanitary Landfill in Half Moon Bay. The Ox Mountain Landfill has a remaining capacity of approximately 22 million cubic yards.[6] Some of the waste material generated by the project would likely be reused onsite or at the landfill, or diverted to recycling facilities. However, conservatively assuming that all of this material required landfill disposal, the total quantity would represent 0.03 percent of the landfill's remaining capacity. Therefore, the project would not be served by a landfill with insufficient capacity to accommodate the project's waste. Impact HZ-3, in Section 4.11, Hazards and Hazardous Materials, provides additional discussion regarding the potential for project activities to encounter and require disposal of naturally occurring asbestos, if present.

For the above reasons, the project would have a less-than-significant impact on utilities and service systems.

4.13.6 Mineral and Energy Resources

The management plan EIR concludes that the establishment of new trails and amenities, along with expanded public access, would not have a significant impact on mineral resources[7] or energy resources.[8] Implementation of the project would not result in the loss of availability of a known mineral resource or a locally important mineral resource because significant aggregate mineral resources have not been identified in the project area, which is not in a designated Mineral Resource Zone, as defined by the California Department of Conservation's Division of Mines and Geology.[9] In addition, the construction and operation of the project would not result in the use of large amounts of fuel, water, or energy, or use them in a wasteful manner, because the project would not involve a water supply connection and would not have appreciable operational energy demands (e.g., new facilities with lighting, heating, cooling). In addition, although construction and maintenance vehicles and project-visitor vehicles would require fuel, usage would not be excessive or wasteful. For these reasons, the project would have no impact on mineral resources and a less-than-significant impact on energy resources.

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6 CalRecycle, *Facility/Site Summary Details: Corinda Los Trancos Landfill (Ox Mtn) (41-AA-0002)*, 2017, *http://www.calrecycle.ca.gov/SWFacilities/Directory/41-AA-0002/Detail/*, accessed April 6, 2017.

7 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section III.C, Geology and Soils (p. III.C-6).

8 San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report*, Section I, Summary (pp, I-5, I-7, I-9, and I-11).

9 California Department of Conservation, *Generalized Mineral Land Classification Map of the South San Francisco Bay Production-Consumption Region*, 1996, *ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/OFR_96-03/OFR_96-03_Plate1.pdf*, accessed April 6, 2017.

4.13.7 Public Services

The management plan EIR concludes that the establishment of new trails and amenities, along with expanded public access, would not have a significant impact on public services.[10] The project is not expected to cause an increase in population and therefore would not significantly affect service ratios, response times, or other performance objectives for public services such that a new or altered governmental facility would be required.

The Bay Area Ridge Trail provides a recreational public service. Sections 4.2 through 4.12 of this EIR address the potentially significant impacts of this trail extension project for each related environmental topic. For example, Section 4.11, Hazards and Hazardous Materials, evaluates the potential fire risk during construction and the adverse effects associated with increased public access within the watershed.

For the reasons described above, the project would have a less-than-significant impact related to the provision of public services.

4.13.8 Agricultural and Forest Resources

The project would not convert Important Farmland to non-agricultural use or conflict with a Williamson Act contract, because there is no Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Williamson Act contracts in the project area.[11] Under the San Mateo County zoning code, the project area is zoned RM – Resource Management, which allows for agricultural uses, timber harvesting, and public recreation. Therefore, the project is an allowable use under existing zoning; it would not require the rezoning of forestland or timberland or preclude the use of watershed lands for these activities. The Farmland Mapping and Monitoring Program maps show that portions of the Fifield-Cahill ridge trail project area are suitable for grazing. While livestock historically grazed on portions of the Peninsula Watershed, the SFPUC has maintained the Fifield-Cahill ridge trail for recreational purposes since the trail opened in 2003; therefore, the project would not convert farmland to non-agricultural use.

The California Department of Forestry and Fire Protection (CalFire) has classified the project area as timberland, as defined under Public Resources Code section 4526, which requires project proponents to obtain a CalFire timberland permit or conversion exemption if it would convert land to non-timberland uses or remove trees. Although the project has been designed to minimize tree removal, including through routing a portion of the proposed southern skyline ridge trail along an existing fuelbreak, the project would require the removal of approximately 170 trees from project areas north and south of S.R. 92. As noted in Chapter 2, Project Description, the SFPUC would seek the appropriate permit or exemption from the California Department of Forestry and Fire Protection before removing any trees. Consistent with the management plan, the SFPUC has historically performed timber operations in the watershed for the purposes of fire

[10] San Francisco Planning Department, *Peninsula Watershed Management Plan Final Environmental Impact Report,* Section III.K, Utilities and Public Services (pp. III.K-1 through III.K-7).

[11] California Department of Conservation, *San Mateo County Important Farmland 2014*, 2016, *ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2014/smt14.pdf*, accessed April 6, 2017.

safety and forest health by removing non-native trees and trees that have succumbed to sudden oak death and other diseases, and by thinning the forest and creating fire breaks for fire management purposes. Project operations and maintenance activities would not differ substantially from those the SFPUC has historically implemented on the watershed for other facilities. For these reasons, the project would have a less-than-significant impact related to agricultural and forest resources.

CHAPTER 5
Other CEQA Issues

This chapter discusses the following topics in relation to the Southern Skyline Boulevard Ridge Trail Extension Project ("project"): growth inducement, significant environmental effects that cannot be avoided if the project is implemented, significant irreversible environmental changes that would result if the project is implemented, and areas of controversy and issues to be resolved.

5.1 Growth Inducement

The California Environmental Quality Act (CEQA) requires that an environmental impact report (EIR) evaluate the growth-inducing impacts of a proposed project.[1] A project could induce growth if it would directly or indirectly foster substantial economic or population growth, the construction of substantial amounts of additional housing, or remove obstacles to population growth. The project would not construct new housing, construct new infrastructure that would enable the development of new housing, and foster substantial economic or population growth. As noted in Section 4.13, Topics Not Requiring Detailed Environmental Analysis, the project would require up to 20 workers during the one-year construction period, and up to one new permanent staff person and about 10 trained volunteers for project operations. Given their small number and the project's proximity to several major population centers, these positions would likely be filled by local labor supply and therefore not require workers to relocate from outside the region. Nonetheless, the small number of jobs created by the project, even if filled by workers from outside the region, would not result in a substantial demand for housing. For these reasons, the project would have no impacts related to growth inducement.

5.2 Significant and Unavoidable Environmental Impacts

In accordance with section 21100(b)(2)(A) of CEQA and with sections 15126(b) and 15126.2(b) of the CEQA guidelines, the purpose of this section is to identify project-related environmental impacts that could not be eliminated or reduced to a less-than-significant level with implementation of all mitigation measures identified in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. The findings in this chapter are subject to final determination by the San Francisco Planning Commission as part of its certification of the EIR.

[1] CEQA guidelines section 15126.2(d).

5.2.1 Transportation

As discussed in Section 4.4, Transportation and Circulation, under Impact TR-5 of this EIR, the project under the proposed access program (docent program on Fifield-Cahill ridge trail and unsupervised/restricted access on southern skyline ridge trail), variant 2 (unsupervised/unrestricted access), and variant 3 (unsupervised/restricted access) could result in a significant and unavoidable impact related to unsupervised visitor access and create potentially hazardous conditions for pedestrians, bicyclists, and equestrians attempting to cross State Route (S.R.) 92 where no marked or signalized crossing exists. This impact would be significant and unavoidable, even with implementation of Mitigation Measure M-TR-5a, Installation of Signage, which calls for installing signage prohibiting crossing of S.R. 92 in the project area, and installing parking restriction signage at the California Department of Transportation (Caltrans) vista point parking lot and along State Route 35 (S.R. 35) near the trailhead for the southern skyline ridge trail. Implementation of this measure would reduce the hazard impacts to pedestrians, bicyclists, and equestrians, but the impact would remain significant because installing signage within the Caltrans right-of-way would be outside of the San Francisco Public Utilities Commission's (SFPUC) control and signage alone might not discourage all potential S.R. 92 crossings by trail users.

Mitigation Measure M-TR-5b, Construction of a Pedestrian/Bicycle/Equestrian Bridge or Roundabout, would require coordination with Caltrans to implement either a grade-separated crossing (bridge) or roundabout and crosswalk to facilitate pedestrian, bicycle, and equestrian access across S.R. 92. Implementation of Mitigation Measure M-TR-5b would reduce the proposed access program and variants 2 and 3 hazard impacts on trail users because it would provide them with a safe way to cross a large and busy state highway where no designated crossing presently exists. However, construction and operation of such a crossing would be contingent upon reaching agreement with Caltrans regarding project scope and design, given the facilities would be located within areas owned and maintained by Caltrans. However, it is currently uncertain whether continued interagency coordination would result in a mutually agreeable crossing solution. For these reasons, the transportation hazard impact would remain significant and unavoidable, with mitigation under the proposed access program and variants 2 and 3.

5.2.2 Biological Resources

As discussed in Section 4.8, Biological Resources, under Impact BI-5 of this EIR, project operations with unsupervised access on the Fifield-Cahill ridge trail under access program variants 2 and 3 could result in significant and unavoidable impacts on special-status wildlife. Unsupervised visitor access along the Fifield-Cahill ridge trail under variants 2 and 3 would increase the potential for visitors, particularly bicyclists and equestrians, to encounter and harm the San Francisco garter snake and California red-legged frog, particularly near Five Points. Similarly, project operations with unsupervised visitor access along the Fifield-Cahill ridge trail under variants 2 and 3 would increase the potential for direct impacts (e.g., trampling and crushing) on Mission blue butterfly or San Bruno elfin butterfly host plants, which could result in a significant and unavoidable impact on listed butterflies, including destruction of larvae and the permanent loss of occupied habitat.

The impact on special-status amphibians and reptiles would be significant and unavoidable, even with implementation mitigation measures M-BI-5a, Protection of Special-status Wildlife During Operations; M-BI-5b, Additional Biological Protections for Unsupervised Access; and M-BI-5c, Mitigation for Permanent Upland Impacts to Special-status Reptiles and Amphibians. These mitigation measures would reduce this impact by limiting operational hours; imposing speed limits for trail traffic; and providing informational signage, enforcement, and mitigation for disturbance to upland dispersal habitat. In addition, as described in Section 2.5, Project Components, and Section 2.7, Project Operations and Maintenance, of Chapter 2, Project Description, the SFPUC would lock trail entries to prevent unauthorized after-hours access that could put users in conflict with San Francisco garter snake and California red-legged frog and also employ trained volunteers and patrols.

Similarly, with respect to special-status butterflies, the impact would be significant and unavoidable, even with implementation of mitigation measures M-BI-2b, Avoidance and Mitigation for Host Plants of Listed Butterfly Species; M-BI-5a, Protection of Special-status Wildlife during Operations; and M-BI-5b, Additional Biological Protections for Unsupervised Access. These mitigation measures would reduce this impact by requiring educational and instructional signage, enforcement, and restoration of host plants and/or payment of an in-lieu fee to promote listed butterfly restoration.

However, in the absence of supervision from trained docents, it cannot be concluded with certainty that visitors would comply with special-status wildlife mitigation measures, including speed limits and other instructional signage intended to protect special-status reptiles and amphibians as well as instructions intended to avoid trampling or other adverse effects on listed butterfly host plants (which could result in the take of special-status butterfly species). Any take of San Francisco garter snake, California red-legged frog, Mission blue butterfly, or San Bruno elfin butterfly would be a significant impact; thus, under variants 2 and 3 on the Fifield-Cahill ridge trail, this impact would remain significant and unavoidable with mitigation.

As also discussed in Section 4.8, under Impact BI-7, unsupervised access under the proposed access program and variants 2 and 3 could result in a significant and unavoidable impact related to accelerated spread of *Phytophthora* pathogens (including sudden oak death). Unsupervised visitor access and associated facilities maintenance activities would increase considerably over baseline conditions, as would visitor traffic through areas known to harbor *Phytophthora* plant pathogens under the proposed access program (southern skyline ridge trail only) and variants 2 and 3. *Phytophthora* spp. are transported through natural mechanisms (e.g., wind and rain), as well as thorough human activities (e.g., pathogen-infected mud or vegetation carried on shoes or tires). While the current extent and rate of transmission within the watershed remains unknown, it is possible that with an increase in the number of visitors to the project area, the rate of transport and potential spread of *Phytophthora* spp. along project trails could also increase. This impact would be considered significant due to potential devastating impacts on natural communities and difficulty controlling the pathogens when a natural community is infested.

This impact would be significant and unavoidable, even with implementation of Mitigation Measure M-BI-7b, Measures to Limit the Spread of *Phytophthora* spp. (including sudden oak

death), which calls for signage and sanitation procedures for visitors entering and leaving each portion of the project area; Mitigation Measure M-BI-7c, Measures to Monitor and Prevent Further Spread of *Phytophthora* spp. Pathogens, which provides for annual monitoring of near-trail vegetation for indications of pathogen infestation, and additional measures and/or corrective action in the event project-related spread is detected; and Mitigation Measure M-BI-4, Operational Measures to Protect Sensitive Species, which requires informational signage to educate the public concerning potential recreational impacts on native vegetation, including plant pathogens, that would help keep visitors on designated trails, thereby further limiting potential for accelerated spread of plant pathogens beyond the project area. In the absence of supervision (e.g., docents), and given that some amount of non-compliance is to be expected with unsupervised access, the full effectiveness of these measures cannot not be assured. Therefore, the impact would remain significant and unavoidable with mitigation under the proposed access program (southern skyline ridge trail) and variants 2 and 3.

Of the significant and unavoidable adverse biological impacts identified in this EIR, the potential spread of *Phytophthora* pathogens (including sudden oak death) would be associated with the proposed access program (on southern skyline ridge trail only). The remaining significant and unavoidable biological impacts disclosed in the EIR would be associated with variants 2 and 3 and would be primarily attributable to unsupervised visitor access.

5.3 Significant Irreversible Environmental Changes

In accordance with CEQA Guidelines sections 15126(c), 15126.2(c), and 15127, the purpose of this section is to identify significant irreversible environmental changes that the project would cause. Such significant irreversible environmental changes might include current or future uses of non-renewable resources, 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 ensure that such current consumption is justified. In general, such irretrievable commitments include the uses of resources such as energy and natural resources that would be required to sustain a project and its inhabitants or occupants over the usable life of the project.

Construction activities associated with the project would result in an irretrievable and irreversible commitment of power supply and construction materials. The project would require commitment of energy resources used to fuel and maintain construction equipment (such as gasoline, diesel, and oil). Project construction would commit resources, such as rock, natural resin, asphaltic concrete, concrete, and steel and other metals, to be used for proposed facilities, improvements, and security features. Until such indeterminate time in the future if or when the SFPUC determines that the proposed trails, facilities, and improvements are no longer required as part of the recreational components of the Peninsula Watershed, the SFPUC would consider this commitment of land an irreversible change. However, during this indeterminate timeframe, these uses would take up limited land area and are compatible with the adjacent land uses and plans and policies that govern the project area.

5.4 Areas of Controversy and Issues to be Resolved

Publication of the Notice of Preparation and subsequent expanded outreach to owners and occupants of properties within 300 feet of the project initiated two 30-day public scoping periods– from December 21, 2016 to February 3, 2017, and expanded outreach from March 30, 2017 to April 29, 2017. The planning department also held a public scoping meeting on January 18, 2017 at the SFPUC offices in San Francisco, California. During the scoping period, interested parties provided a total of 56 comments, including letters, emails, and oral comments. The comment letters, emails, and transcript of the comments received at the public scoping meeting are available for review as part of Case File No. 2016-016100ENV. The planning department has considered the comments made by the public in preparation of the Draft EIR for the project. This EIR addresses and analyzes comments on the Notice of Preparation that relate to environmental issues throughout, and these issues include the following:

- Environmental effects of different access programs, including docent-led and unsupervised access
- Estimated number of trail users
- Effects on scenic resources
- Effects of unsupervised access on historical sites and cultural resources
- Effects of unsupervised access on ability of users to safely cross S.R. 92 and S.R. 35
- Effects of construction on traffic and circulation on S.R. 35
- Effects of unsupervised access on wildlife and habitat, including that regarding special-status species
- Effects of unsupervised access on the spread of invasive species and sudden oak death
- Effects of unsupervised access regarding fire hazards

Section 1.3, Notice of Preparation and Public Scoping Process, in Chapter 1, Introduction, provides further detail on the public comments received and provides a cross-reference to where each comment is addressed in this document.

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CHAPTER 6
Alternatives

6.1 Introduction

This chapter presents the California Environmental Quality Act (CEQA) alternatives analysis for the San Francisco Public Utility Commission's (SFPUC) Southern Skyline Boulevard Ridge Trail Extension Project (project). Section 6.1, Introduction, presents an overview of the CEQA requirements for alternatives analysis. Section 6.2, Alternative Selection, describes the methodology used to identify and select a reasonable range of alternatives to the project for detailed CEQA analysis. Section 6.3, CEQA Alternatives, describes and evaluates the selected alternatives that could avoid or substantially lessen the impacts of the project determined to be significant and unavoidable, while still meeting most of the project objectives. These alternatives are evaluated for their effects relative to those identified for the project, as well as their comparative merits with respect to minimizing adverse environmental effects that identified for the project Chapter 4, Environmental Setting, Impacts, and Mitigation Measures. Based on this analysis, Section 6.4, Alternatives Comparison and the Environmentally Superior Alternative, compares the impacts of the action alternatives and no project alternative against those of the project and identifies the environmentally superior alternative. Finally, Section 6.5, Alternatives Considered but Eliminated from Further Analysis, describes other alternative concepts that the planning department considered as part of the environmental review process but eliminated from detailed consideration and identifies the reasons for their elimination.

6.1.1 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 project that would feasibly attain most of the project's basic objectives but would avoid or substantially lessen any identified significant adverse environmental effects of the project. Specifically, the CEQA Guidelines (section 15126.6) set forth the following criteria for selecting and evaluating alternatives:

- ***Identifying Alternatives.*** The selection of alternatives is limited to those that would avoid or substantially lessen any of the significant effects of the project, are feasible, and would attain most of the basic objectives of the project. Factors that might be considered when addressing the feasibility of an alternative include site suitability, availability of infrastructure, general plan consistency, other plans or regulatory limitations, jurisdictional boundaries, economic viability, and whether the proponent can reasonably acquire, control, or otherwise have access to an alternative site. An EIR need not consider an alternative for which impacts

cannot be reasonably ascertained and for which implementation is remote and speculative. The specific alternative of "no project" must also be evaluated.

- ***Range of Alternatives.*** An EIR need not consider every conceivable alternative, but must consider and discuss a reasonable range of feasible alternatives in a manner that will foster informed decision-making and public participation. The "rule of reason" governs the selection and consideration of EIR alternatives, requiring that an EIR set forth only those alternatives necessary to permit a reasoned choice. The lead agency is responsible for selecting a range of project alternatives to be examined and for disclosing its reasons for the selection of the alternatives. An EIR is not required to consider alternatives that are infeasible.
- ***Evaluation of Alternatives.*** EIRs are required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the project. Matrices may be used to display the major characteristics and the environmental effects of each alternative. If an alternative would cause one or more significant effects that would not result from the project as proposed, the significant effects of the alternative must be discussed, but in less detail than the significant effects of the project.

6.2 Alternatives Selection

Consistent with CEQA, the planning department focused the approach to alternatives selection for the project on identifying alternatives that: (1) could meet most of the basic objectives of the project while reducing one or more of its impacts, (2) could foster informed decision-making and public participation, and (3) could be feasible.

The planning effort for the project considered multiple public access program configurations that would enhance recreational and educational opportunities within the Peninsula Watershed (i.e., docent-led, unsupervised/restricted, and unsupervised/unrestricted). As described in Chapter 1, Introduction (Section 1.1.1, Background), the Peninsula Watershed Management Plan EIR (management plan EIR) considered a number of trail and access program configurations (referred to in that document as "alternatives"), ranging from docent-led to unsupervised access. The proposed access program and variants (referred to generally herein as "the project") encompass the range of access program configurations considered in the management plan EIR. Thus, this EIR evaluates the range of access configurations in full as part of the project, not as alternatives to the project.

In the project alternatives selection process, the planning department eliminated two alternatives from consideration because those alternatives would have had the same or more severe environmental impacts compared to the project and retained three action alternatives. Section 6.3, CEQA Alternatives, presents and analyzes the action alternatives and the no project alternative. Section 6.5, Alternatives Considered but Eliminated from Further Analysis, discusses the two alternatives considered but eliminated from further analysis, n including the reasons for their elimination.

6.2.1 Project Objectives

As discussed in Chapter 2, Project Description (Section 2.4.2, Project Objectives), the objectives of the project are to:

1. Enhance public awareness of water quality, water supply, ecological, and watershed protection issues by providing compatible recreational opportunities in the Peninsula Watershed
2. Provide opportunities to educate the general public about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including its unique and diverse habitats
3. Extend the Bay Area Ridge Trail south from State Route 92 (S.R. 92) to the Golden Gate National Recreation Area's Phleger Estate
4. Improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities
5. Support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay

These objectives also support the primary and secondary goals of the Peninsula Watershed Management Plan.

6.2.2 Summary of Significant Environmental Impacts

The primary goal of the alternatives selection process is to identify alternatives that could avoid or substantially lessen impacts of the project determined to be significant and unavoidable. Impacts of the project determined to be less than significant with mitigation are also considered, as they aid in identification of and distinction among a reasonable range of alternatives. The following summarizes the conclusions for potentially significant and significant impacts of the project that Chapter 4, Environmental Setting, Impacts, and Mitigation Measures identifies.

6.2.2.1 Significant and Unavoidable Impacts

Project implementation would result in the following significant and unavoidable impacts, depending upon the chosen access program variant:

Biological Resources

- Project operations with unsupervised visitor access along Fifield-Cahill ridge trail would increase the potential for visitors, particularly bicyclists and equestrians, to encounter and harm the San Francisco garter snake and California red-legged frog, particularly in the area of Five Points. (Impact BI-5; access program variants 2 and 3)
- Project operations with unsupervised visitor access along Fifield-Cahill ridge trail would increase the potential for direct impacts (e.g., trampling and crushing) on Mission blue butterfly or San Bruno elfin butterfly host plants, which could result in take of listed butterflies, including destruction of larvae and the permanent loss of occupied habitat. (Impact BI-5; access program variants 2 and 3)

- Project operations with unsupervised access could result in substantial adverse impacts related to accelerated spread of *Phytophthora* pathogens (including sudden oak death). (Impact BI-7; proposed access program [southern skyline ridge trail] and variants 2 and 3)

Transportation and Circulation

- Project operations with unsupervised visitor access would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross S.R. 92 where no marked or signalized crossing exists. (Impact TR-5; proposed access program and variants 2 and 3)

6.2.2.2 Significant Impacts that can be Mitigated to Less than Significant

Project implementation would result in the following significant impacts, all of which could be reduced to a less-than-significant level with the implementation of mitigation measures identified in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, under each of the respective impacts:

Cultural Resources

- Project construction and operations could cause a substantial adverse change in the significance of archeological resources, but implementation of accidental discovery measures would reduce this impact to less than significant. (Impact CU-1 and Impact CU-3; proposed access program and variants)

- Project construction and operations could cause a substantial adverse effect related to the disturbance of human remains, but implementation of accidental discovery measures would reduce this impact to less than significant. (Impact CU-2 and Impact CU-4; proposed access program and variants)

Noise and Vibration

- Project construction along the southern skyline ridge trail would result in a substantial temporary increase in ambient noise levels at the closest sensitive receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance, but implementation of construction noise reduction measures would reduce the impact to less than significant. (Impact NO-1; proposed access program and variants)

Air Quality

- Project construction-related criteria pollutant and fugitive dust emissions could violate air quality standards and contribute substantially to an existing air quality violation, but implementation of measures requiring Tier 4 engines for selected equipment, where feasible, and incorporation of the Bay Area Air Quality Management District (air district) basic construction measures would reduce this impact to less than significant. (Impact AQ-1, proposed access program and variants)

- Project construction-related criteria pollutant and fugitive dust emissions could conflict with or obstruct implementation of the 2017 Clean Air Plan, but implementation of measures requiring Tier 4 engines for selected equipment, where feasible, and incorporation of the air district basic construction measures would reduce this impact to less than significant. (Impact AQ-6, proposed access program and variants)

- Project construction-related criteria pollutant and fugitive dust emissions could result in a considerable contribution to cumulative impacts, but implementation of measures requiring Tier 4 engines for selected equipment, where feasible, and air district basic construction measures would reduce this impact to less than significant. (Impact C-AQ-1, proposed access program and variants)

Biological Resources

- Project construction could result in substantial adverse impacts on special-status plants, but implementation of avoidance and minimization measures for special-status plants, a revegetation plan, and worker environmental training would reduce this impact to less than significant. (Impact BI-1, proposed access program and variants)

- Project construction along Fifield-Cahill ridge trail could result in substantial adverse impacts on San Francisco garter snake, but implementation of a revegetation plan, worker environmental training, and avoidance and minimization measures for special-status reptiles and amphibians would reduce this impact to less than significant. (Impact BI-2, proposed access program and variants 2 and 3)

- Project construction could result in substantial adverse impacts on California red-legged frog, but implementation of a revegetation plan, worker environmental training, and avoidance and minimization measures for special-status reptiles and amphibians would reduce this impact to less than significant. (Impact BI-2, proposed access program and variants)

- Project construction along Fifield-Cahill ridge trail could result in substantial adverse impacts on marbled murrelet, but implementation of worker environmental training would reduce this impact to less than significant. (Impact BI-2, access program variants 2 and 3)

- Project construction along Fifield-Cahill ridge trail could result in substantial adverse impacts on special-status butterflies, but implementation of worker environmental training as well as avoidance and mitigation for host plants of listed butterfly species would reduce this impact to less than significant. (Impact BI-2, proposed access program and variants)

- Project construction could result in substantial adverse impacts on dusky-footed woodrat and American badger, but implementation of avoidance and minimization measures for special-status mammals would reduce this impact to less than significant. (Impact BI-2, proposed access program and variants)

- Project construction could result in substantial adverse impacts on nesting birds and special-status bats and maternity roosts, but implementation of measures to minimize disturbance to nesting bird species and avoidance and mitigation measures for special-status bats and maternity roosts would reduce this impact to less than significant. (Impact BI-2, proposed access program and variants)

- Project construction could result in substantial impacts on upland vegetation within sensitive natural communities, but implementation of minimizing, monitoring, and compensatory replacement measures for impacts on special natural communities would reduce this impact to less than significant. (Impact BI-3, access program variants 2 and 3)

- Project operations with unsupervised access along Fifield-Cahill ridge trail could result in substantial adverse impacts on special-status plants, but implementation of avoidance measures for special-status plant species and operational measures to protect these species would reduce this impact to less than significant. (Impact BI-4, variants 2 and 3)

- Project operations with unsupervised access along southern skyline ridge trail could result in substantial adverse impacts on San Francisco garter snake and California red-legged frog, but implementation of protection measures for special-status wildlife during operations and additional wildlife protections for unsupervised access would reduce this impact to less than significant. (Impact BI-5, proposed access program and variants 2 and 3)
- Project operations with unsupervised access along Fifield-Cahill ridge trail could result in substantial adverse impacts on marbled murrelet, but implementation of operational measures to protect sensitive species, protective measures for special-status wildlife during operations, and additional wildlife protections for unsupervised access would reduce this impact to less than significant. (Impact BI-5, variants 2 and 3)
- Project operations with docent-led access along Fifield-Cahill ridge trail could result in substantial adverse impacts on special-status butterflies, but implementation of avoidance and mitigation for listed butterfly host plants would reduce this impact to less than significant. (Impact BI-5, proposed access program and variant 1)
- Project operations could result in substantial adverse impacts on nesting birds, but implementation of measures to minimize disturbance to nesting bird species would reduce this impact to less than significant. (Impact BI-5, proposed access program and variants)
- Project operations with unsupervised access along Fifield-Cahill ridge trail could result in substantial adverse effects on wildlife movement, but implementation of measures for protection of special-status wildlife during operations would reduce this impact to less than significant. (Impact BI-5, variants 2 and 3)
- Project construction and operations could result in substantial adverse impacts related to the spread of invasive plant species, but implementation of measures to reduce spread of invasive plants would reduce this impact to less than significant. (Impact BI-7; proposed access program and variants)
- Project operations with docent-led access could result in substantial adverse impacts related to the spread of plant pathogens, but implementation of measures to limit the spread of *Phytophthora* spp. and other pathogens would reduce this impact to less than significant (Impact BI-7; proposed access program [Fifield-Cahill ridge trail] and variant 1)

Hazards and Hazardous Materials

- Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires, but implementation of fire safety measures during construction would reduce this impact to less than significant. (Impact HZ-5; proposed access program and variants)
- Project operations with unsupervised access could expose people or structures to substantial risk of loss, injury, or death involving wildland fires, but implementation of a fire management plan would reduce this impact to less than significant. (Impact HZ-8; proposed access program [southern skyline ridge trail], and variants 2 and 3)

Tribal Cultural Resources

- Project construction and operations could cause a substantial adverse change in the significance of a tribal cultural resource, but implementation of a tribal cultural resources preservation or protection plan would reduce this impact to less than significant. (Impact TCR-1 and Impact TCR-2; proposed access program and variants)

6.2.3 Alternatives Screening and Selection

In order to qualify as a project alternative under CEQA, an alternative would need to (1) avoid or substantially lessen one or more of the significant adverse impacts of the project, (2) be potentially feasible, and (3) meet most of the basic objectives of the project. The planning department based the alternatives selection process for the project on first identifying alternatives that would avoid or lessen the significant and unavoidable impacts identified above. Whether potential alternatives would avoid or lessen potentially significant impacts was also considered to aid in identification of and distinction among a reasonable range of alternatives. In addition, the planning department identified potential alternatives from scoping comments received following issuance of the Notice of Preparation (see Chapter 1, Section 1.3, Notice of Preparation and Public Scoping, and Table 1-1, Summary of Scoping Comments). The planning department then screened the potential alternatives for their feasibility and ability to meet most of the project objectives. This process resulted in the selection of three action alternatives. The planning department determined that the three action alternatives that were carried forward for detailed evaluation, when coupled with the no project alternative, represent a reasonable range of alternatives described and analyzed in this EIR.

6.2.3.1 Potential Alternatives Identified During the Scoping Process

Two alternative strategies were identified during the project scoping process. The Sierra Club (Loma Prieta and San Francisco Bay chapters) submitted a letter during the public scoping period requesting the EIR consider a "no project" alternative. As noted in Section 6.1.1, CEQA Requirements for Alternatives Analysis, consideration of a no project alternative is required for all EIRs and is presented herein as alternative A. In addition, SF Urban Riders submitted a letter requesting the EIR consider Skyline Quarry as a primary access point for the Fifield-Cahill ridge trail. The commenter explained that a trail access off Quarry Road would reduce the distance and elevation bicyclists approaching from existing trails to the east (e.g., along Cañada Road and State Route 35 [S.R. 35]) would have to travel along S.R. 92. As described below in Section 6.5, Alternatives Considered but Eliminated from Further Analysis, the planning department rejected this alternative strategy because it would not substantially reduce impacts identified for the project.

6.2.3.2 Identifying Potential Alternatives to Avoid or Lessen Significant Impacts

This section presents, by potential alternative, the types of impacts that the alternatives would reduce.

Relocated Parking Lot and Trailhead South of S.R. 92. The identified significant and unavoidable operational transportation hazards impacts are related to the potential for unsupervised project visitors to attempt crossing S.R. 92 at its intersection with S.R. 35.[1] With the project, the proximity of the southern skyline ridge trail parking lot and trailhead (southern side of S.R. 92) to the segment of existing Bay Area Ridge Trail that terminates at the Cahill Ridge Road/S.R. 92 (northern side of S.R. 92) could entice visitors to attempt a crossing at this location to reach the opposite trail. Shifting

[1] S.R. 35 is also Skyline Boulevard in this location.

the trailhead and parking lot south a considerable distance away from the S.R. 35/S.R. 92 intersection, and not constructing a trail segment between this intersection and the alternative trailhead and parking lot location, could remove the incentive for visitors to attempt crossing S.R. 92, thereby reducing or avoiding the significant transportation hazard. Shifting the trailhead south would shorten the length of trail between the trailhead and Phleger Estate. Shortening the trail would also reduce construction-related impacts on cultural and tribal cultural resources, air quality, noise, biological resources, and fire hazards. A shorter trail would similarly reduce the cultural and tribal cultural resources, biological resources, and fire hazards impacts that could result from project operations. See Section 6.3.2, Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92, for a detailed discussion of this alternative.

Relocated Trailhead and Parking Lot North of S.R. 92. Project implementation could result in significant and unavoidable operational impacts related to transportation hazards at the S.R. 35/S.R. 92 intersection. Shifting the location of the trailhead/parking lot proposed near Cemetery Gate (north of S.R. 92) 1.25 mile east to Skyline Quarry, and not constructing a new 50-car parking lot near or providing new access at Cemetery Gate, could reduce the incentive for visitors to attempt crossing S.R. 92 to reach the opposite trail segment. However, this potential alternative would have other potentially significant impacts equal to or greater than those identified for the project. See Section 6.5.1, Relocated Trailhead and Parking Lot North of S.R. 92, for a detailed discussion of this concept.

Pedestrian-Only Trail Access. The identified significant and unavoidable operational impacts related to special-status amphibians and reptiles concern the potential for unsupervised Fifield-Cahill ridge trail visitors to harm San Francisco Garter Snake and California red-legged frog. Such impacts would primarily result from increased bicyclist and equestrian use. Restricting access to only pedestrians, who travel at a slower pace and closer to the ground, could reduce such impacts because pedestrians are generally better able to see and avoid harm to special-status amphibian and reptile species. See Section 6.3.3, Alternative C: Pedestrian-Only Trail Access, for a detailed discussion of this alternative.

Alternative Trail Alignment. The identified significant and unavoidable operational impacts related to Mission blue butterfly and San Bruno elfin butterfly (see Section 4.8.4., Impacts and Mitigation Measures, Section 4.8, Biological Resources) concern the potential for unsupervised visitors to trample and crush occupied host plants that grow along and in the Fifield-Cahill ridge trail. The identified significant and unavoidable impacts related to infectious plant pathogens concern the potential for unsupervised visitors to increase the rate of spread for *Phytophthora* pathogens (including sudden oak death). An alternative trail alignment that avoids the Fifield-Cahill ridge trail, and instead relies upon limited trail creation and improvements using the existing Crystal Springs Regional Trail, could reduce or avoid impacts on special-status butterflies and spread of plant pathogens. Using existing trail would reduce the length of trail requiring construction and improvement and also reduce the cultural and tribal cultural resources, air quality, and fire hazards impacts associated with project construction. For the same reason, a shorter trail would similarly reduce the cultural and tribal cultural resources and fire hazards impacts that could result from project operations. However, this alternative would also likely cause new impacts on sensitive natural plant communities and special-status reptiles,

amphibians, and butterflies. See Section 6.3.4, Alternative D: Alternative Trail Alignment, for a detailed discussion of this alternative.

Fifield-Cahill Ridge Trail Realignment. As noted previously, significant and unavoidable operational impacts on Mission blue butterfly and San Bruno elfin butterfly could result from unsupervised visitors trampling and crushing occupied host plants that grow in and along the Fifield-Cahill ridge trail. Rerouting segments of this trail to avoid areas with lupine species could reduce or avoid such impacts. However, this potential alternative would have other potentially significant impacts equal to or greater than those identified for the project. See Section 6.5.2, Fifield-Cahill Ridge Trail Realignment, for a detailed discussion of this concept.

Alternative Construction Approach. The identified significant construction impacts related to cultural and tribal cultural resources, noise and vibration, air quality, biological resources, and hazards and hazardous materials would result from ground disturbance and general use of construction equipment, rather than from any specific construction method or technique. The SFPUC could mitigate all of these construction impacts to less than significant with standard mitigation measures. However, given that the area of ground disturbance during construction would be comprised almost entirely of trail and fencing installation corridors, and temporary construction staging areas, there are limited options, if any, for modifying the construction scenario that would substantially reduce the area of ground disturbance or construction equipment use. Also, past project experience using these measures has demonstrated the measures to be effective in reducing the severity of the impacts to a less-than-significant level. Therefore, the planning department has not identified any alternative construction approaches in the project area that warrant further analysis in this EIR.

6.3 CEQA Alternatives

The following alternatives are analyzed in this chapter:

- Alternative A: No Project
- Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92
- Alternative C: Pedestrian-Only Trail Access
- Alternative D: Alternative Trail Alignment

Because the alternatives are conceptual, this evaluation is based on the best available information and reasonable assumptions about how SFPUC would implement each alternative. For each alternative, this section presents the following:

- A description of the alternative, including facility and component revisions. Each description discusses feasibility issues as well as assumptions regarding the construction methods likely to be used.
- An evaluation of the alternative's ability to meet project goals and objectives.
- Analysis of the potential environmental impacts of each alternative compared to those of the project.

Table 6-1 summarizes and compares the characteristics of the project with those of alternatives A, B, C, and D. These four alternatives were determined to adequately represent the range of feasible alternatives required under CEQA for the project. Table 6-2 summarizes the ability of the four alternatives to meet the project objectives. Alternative A, No Project, is included, as required by CEQA Guidelines section 15126.6(e), even though it would not meet the basic project objectives. Alternative B, Relocated Parking Lot and Trailhead South of S.R. 92, is a potentially feasible alternative that would meet project objectives 1, 2, and 4, while partially meeting objectives 3 and 5. Alternative C, Pedestrian-Only Trail Access, is a potentially feasible alternative that would meet project objectives 1, 2, 3, and 4, while partially meeting objective 5. Alternative D, Alternative Trail Alignment, is a potentially feasible alternative that would meet project objectives 1 and 2, partially meet objective 5, and not meet objectives 3 and 4.

As discussed in Chapter 2, Project Description, the SFPUC is considering a range of access program configurations for the project, including the proposed access program (supervised [docent-led] access along Fifield-Cahill ridge trail and unsupervised/restricted [with a permit] access along southern skyline ridge trail), variant 1 (docent-led access), variant 2 (unsupervised/ unrestricted access), and variant 3 (unsupervised/restricted access). Similarly, as noted in Section 6.2, Alternatives Selection, this analysis assumes that each of the action alternatives would provide for the same range of access program configurations identified for the project (i.e., docent-led, unsupervised/restricted, unsupervised/unrestricted). Accordingly, as summarized in Table 6-3, the evaluation of alternatives examines the potential effects of the alternatives relative to those that could occur under the project in absolute terms, rather than with particular emphasis on a given access program configuration. Nevertheless, Table 6-4 is provided to highlight the differences between the alternatives across the range of access program configurations considered in this EIR.

6.3.1 Alternative A: No Project

6.3.1.1 Description

As required by CEQA Guidelines section 15126.6(e), this EIR evaluates a No Project Alternative to allow decision-makers to compare the environmental effects of approving the project with the effects of not approving the project. The No Project Alternative represents what would reasonably be expected to occur in the foreseeable future if the San Francisco Planning Commission does not approve the project.

Thus, under the No Project Alternative, the SFPUC would not construct the project. There would be no changes in the existing docent program for the Fifield-Cahill ridge trail, the Fifield-Cahill ridge trail improvements would not be implemented, and the southern skyline ridge trail would not be constructed. The SFPUC would continue to operate and maintain the Fifield-Cahill ridge trail and associated existing facilities as under current conditions and watershed management procedures. Visitation under the No Project Alternative would be similar to existing visitation levels. There would be no feasibility issues associated with implementation of this alternative.

TABLE 6-1
COMPARISON OF PROJECT AND ALTERNATIVES

Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Multi-modal (pedestrian, bicyclist, equestrian) access along approximately 16 miles of trails between Sweeney Ridge and Phleger Estate. A new 6-mile-long ridge trail along S.R. 35 to be served by a new 20-car parking lot near the S.R. 92 intersection, and two new restrooms. A new 0.5-mile universal access loop trail (including Americans with Disabilities Act-compliant access and parking) along the existing Fifield-Cahill ridge trail, a new 50-car parking lot, and one new restroom near Cemetery Gate. Access program modifications ranging from supervised access, similar to the existing docent program, to unsupervised/unrestricted access. New barbed-wire fencing along the trail alignment, ranging from 9 to 25 miles, depending upon access program selected. Transfer of public access easement along an existing trail segment of the Bay Area Ridge Trail through Skylawn Memorial Park from Bay Area Ridge Trail Council to SFPUC. Educational programming, including interpretive educational information for recreational trail users, and volunteer-hosted school program visits, based upon the Peninsula Watershed Trail Interpretive Master Plan.	Docent-led multi-modal access along the approximately 10-mile-long Fifield-Cahill ridge trail would continue as under current conditions (i.e., up to three groups of 20 people, three days per week). Use would not be expanded, and no physical improvements would occur.	Same as project, except the trailhead and parking lot for the southern skyline ridge trail would be moved south by approximately 1.5 miles and length of new trail would be approximately 4.5 miles; no trail or barbed-wire fencing would be constructed between S.R. 92 and the new trailhead and parking area.	Same as project, except access restricted to pedestrians only (i.e., no bicyclist or equestrian access).	Two new trail segments to improve connection between Sweeney Ridge and Huddart Park via existing trails along the east side of the Peninsula Watershed; no improvements along the 10-mile Fifield-Cahill ridge trail, no new 6-mile southern skyline ridge trail. A new 1.2-mile trail along an existing watershed service road connecting Sweeney Ridge Trail (0.2-mile south of Sneath Lane) with the Crystal Springs Regional Trail (0.5-mile south of San Bruno Avenue). Multi-use public access along the 1.2-mile trail segment ranging from supervised access, similar to the existing docent program, to unsupervised / unrestricted access. New barbed-wire fencing along both sides of the new trail segment, depending upon access program selected. Establishment of 1.3 miles of new multi-use trail between Crystal Springs Regional Trail's Sawyer Camp segment in the north (0.4 mile south of Bunker Hill Road) and the Crystal Springs segment (at the S.R. 92/Cañada Road intersection). Two existing, unimproved roadside turn-outs along the Crystal Springs Regional Trail improved (paved/striped) to facilitate better trail access, including approximately 30 new parking spaces, with a new restroom with vault toilet installed at each improved parking area. Educational programming same as for project.

TABLE 6-2
SUMMARY OF ABILITY OF ALTERNATIVES TO MEET PROJECT OBJECTIVES

Project Objective	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
	Would the alternative meet this objective?			
1. Enhance public awareness of water quality, water supply, ecological, and watershed protection issues by providing compatible recreational opportunities in the Peninsula Watershed.	No	Yes	Yes	Yes
2. Provide opportunities to educate the general public about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including its unique and diverse habitats.	No	Yes	Yes	Yes
3. Extend the Bay Area Ridge Trail south from S.R. 92 to the Golden Gate National Recreation Area's Phleger Estate.	No	Partial	Yes	No
4. Improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities.	No	Yes	Yes	No
5. Support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay.	No	Partial	Partial	No

TABLE 6-3
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Cultural Resources	**Impact CU-1:** Project construction could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact CU-2: Project construction could disturb human remains, including those interred outside of formal cemeteries.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact CU-3: Project operations could cause a substantial adverse change in the significance of an archeological resource pursuant to CEQA Guidelines section 15064.5.	No impact.	Reduced due to somewhat smaller project footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation.
	Impact CU-4: Project operations could disturb human remains, including those interred outside of formal cemeteries.	No impact.	Reduced due to somewhat smaller project footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation
Transportation and Circulation	**Impact TR-5:** Project operations would not create potentially hazardous conditions for vehicles entering and exiting the project area; however, project operations would increase the risk of conflicts between vehicles and pedestrians, bicyclists, or equestrians attempting to cross State Route 92.	No impact.	Hazard posed by visitors crossing S.R. 92 would be eliminated; reduced impact related to vehicles turning to and from relocated parking lot; less than significant.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use; significant and unavoidable with mitigation).	Slightly reduced, hazard posed by visitors crossing S.R. 92 would be shifted to new trail alignment; significant and unavoidable with mitigation; hazards posed by vehicles turning into parking lot would be reduced; significant and unavoidable with mitigation.
Noise and Vibration	**Impact NO-1:** Construction of the project would result in a substantial temporary increase in ambient noise levels at the closest receptors, and could expose people to substantial noise levels in excess of standards established in the San Mateo County Noise Ordinance.	No impact.	Reduced, due to relocation of parking lot and trailhead, and would avoid construction noise impacts associated with installation of prefabricated bridge; less than significant with mitigation.	Same as project.	Substantially reduced due to distance from sensitive receptors, reduced construction duration, and smaller project footprint; less than significant with mitigation.

TABLE 6-3 (CONTINUED)
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Air Quality	**Impact AQ-1:** Emissions generated during project construction activities could violate air quality standards and contribute substantially to an existing air quality violation.	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant with mitigation.
	Impact AQ-6: Implementation of the project could conflict with or obstruct implementation of the 2017 Clean Air Plan.	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant with mitigation.
	Impact C-AQ-1: Construction and operation of the project could result in cumulatively considerable increases of criteria pollutant emissions. (Less than significant with mitigation for the proposed access program and variants)	No impact.	Reduced due to somewhat decreased construction duration and footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced construction duration and footprint; less than significant.
Biological Resources	**Impact BI-1:** Construction of the project could result in substantial adverse impacts on special-status plants.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Increased due to potential impacts on additional special-status plants in alternative alignment, less than significant with mitigation.
	Impact BI-2: Construction of the project could result in substantial adverse impacts on special-status wildlife.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Similar to project for special-status amphibians and reptiles due to preferred habitat proximity, less than significant with mitigation.
	Impact BI-3: Construction of the project could result in substantial impacts on sensitive natural communities, including riparian habitat and wetlands.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Similar to project due to sensitive natural communities in vicinity of alternative alignment, less than significant with mitigation.
	Impact BI-4: Project operations could result in substantial adverse impacts on special-status plants.	No impact.	Same as project; the project footprint north of S.R. 92 would not change.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use); less than significant with mitigation.	Increased due to potential impacts on additional special-status plants in alternative alignment ; less than significant with mitigation.

TABLE 6-3 (CONTINUED)
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES

Environmental Resource	Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Biological Resources (cont.)	**Impact BI-5:** Project operations could result in substantial adverse impacts on special-status wildlife.	No impact.	Same as project for special-status wildlife on Fifield-Cahill ridge trail; reduced impacts for San Francisco garter snake, California red-legged frog, and nesting birds along southern skyline ridge trail due to somewhat smaller project footprint. Significant and unavoidable with mitigation.	Potential for significant effects on special-status amphibian and reptile species from bicyclists and equestrians eliminated; potential effects on other special-status species would be same as project; significant and unavoidable with mitigation.	Potential for significant effects on special-status butterfly reduced; would be similar or increased for special-status amphibians and reptiles due to preferred habitat proximity. Potential effects on other special-status species would be similar to the project but substantially reduced due to smaller project footprint. Significant and unavoidable with mitigation.
	Impact BI-7: Project construction and operations would result in substantial adverse impacts related to the spread of invasive plant species and pathogens.	No impact.	Reduced due to somewhat decreased project footprint; significant and unavoidable with mitigation.	Slightly reduced because hikers would not likely travel as far as bicyclists or equestrians, thereby limiting the potential extent of spread; significant and unavoidable with mitigation.	Substantially reduced because the extent of new trails would be considerably smaller, unfavorable to hosting plant pathogens (e.g., paved or graveled), and present limited opportunity for spread if transmission occurred. Less than significant with mitigation.
Hazards and Hazardous Materials	**Impact HZ-5:** Project construction could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	No impact.	Reduced due to somewhat decreased construction area; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact HZ-8: Project operations could expose people or structures to a substantial risk of loss, injury, or death involving wildland fires.	No impact.	Reduced due to somewhat decreased project footprint; less than significant with mitigation.	Slightly reduced, due to lower overall visitation (no bicycle or equestrian use); less than significant with mitigation.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation.
Tribal Cultural Resources	**Impact TCR-1:** Project construction could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	No impact.	Reduced due to somewhat smaller construction footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to smaller construction footprint; less than significant with mitigation.
	Impact TCR-2: Project operations could cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code section 21074.	No impact.	Reduced due to somewhat smaller project footprint; less than significant with mitigation.	Same as project.	Substantially reduced due to reduced areas of new visitor access; less than significant with mitigation

TABLE 6-4
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES, BY ACCESS PROGRAM CONFIGURATION

Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Proposed Access Program (supervised access on unfenced Fifield-Cahill ridge trail, and unsupervised and restricted (i.e., with a permit) access on fenced southern skyline ridge trail): SUM impacts related to transportation hazards and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	No impact.	Reduced; avoids transportation impact, somewhat smaller project footprint. SUM impact related to spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	Similar to project. Construction impacts same as project. Some operations impacts slightly reduced due to lower overall visitation. Continued SUM impacts related to transportation hazards and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	(Supervised access on fenced Sweeney Ridge connector, unsupervised and unrestricted access on fenced Crystal Springs Regional Trail connector) Increased; reduces butterfly and plant pathogen impacts; somewhat reduces transportation impact; increases special-status reptiles and amphibians, special-status plants, and sensitive natural communities impacts; reduces intensity of other effects due to substantially smaller project footprint. SUM impacts related to transportation hazards and special-status reptiles and amphibians. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.
Access Program Variant 1 (supervised access on unfenced Fifield-Cahill ridge trail and unfenced southern skyline ridge trail)**:** LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	No impact.	Reduced; somewhat smaller project footprint. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	Similar to project. Construction impacts same as project. Some operations impacts slightly reduced due to lower overall visitation. Continued LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	(Supervised access on fenced Sweeney Ridge connector, unsupervised and unrestricted access on fenced Crystal Springs Regional Trail connector) Increased; reduces butterfly and plant pathogen impacts; increases transportation impact; increases special-status reptiles and amphibians, special-status plants, and sensitive natural communities impacts; reduces intensity of other effects due to substantially smaller project footprint. SUM impacts related to transportation hazards and special-status reptiles and amphibians. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.

TABLE 6-4 (CONTINUED)
COMPARISON OF THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROJECT VS. THE IMPACTS OF THE ALTERNATIVES, BY ACCESS PROGRAM CONFIGURATION

Project	Alternative A: No Project	Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92	Alternative C: Pedestrian-Only Trail Access	Alternative D: Alternative Trail Alignment
Access Program Variant 2 (unsupervised and unrestricted access on fenced Fifield-Cahill ridge trail and fenced southern skyline ridge trail)**:** SUM impacts related to transportation hazards; special-status amphibians, reptiles, and butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	No impact.	Reduced; avoids transportation impact; somewhat smaller project footprint. SUM impacts related to special-status amphibians, reptiles, and butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	Reduced; avoids special-status amphibian and reptile impact; retains transportation, special-status-butterfly, and plant pathogens impact; some operations impacts slightly reduced due to lower overall visitation; other impacts same as project. SUM impacts related to transportation hazards, special-status butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	(Unsupervised and unrestricted access on fenced Sweeney Ridge connector and fenced Crystal Springs Regional Trail connector) Similar to project; reduces special-status butterfly and plant pathogen impacts; somewhat reduces transportation impact; increases special-status reptiles and amphibians, special-status plants, and sensitive natural communities impacts; reduces intensity of other effects due to substantially smaller project footprint. SUM impacts related to transportation hazards and special-status reptiles and amphibians. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.
Access Program Variant 3 (unsupervised and restricted (i.e., with a permit) access on fenced Fifield-Cahill ridge trail and fenced southern skyline ridge trail)**:** SUM impacts related to transportation hazards; special-status amphibians, reptiles, and butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	No impact.	Reduced; avoids transportation impact; somewhat smaller project footprint. SUM impacts related to special-status amphibians, reptiles, and butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	Reduced; avoids special-status amphibian and reptile impact; retains transportation, special-status-butterfly, and plant pathogens impacts; some operations impacts slightly reduced due to lower overall visitation; other impacts same as project. SUM impacts related to transportation hazards, special-status butterflies, and spread of plant pathogens. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.	(Unsupervised and restricted access on fenced Sweeney Ridge connector, unsupervised and unrestricted access on fenced Crystal Springs Regional Trail connector) Similar to project; reduces special-status butterfly and plant pathogen impacts; somewhat reduces transportation impact; increases special-status reptiles and amphibians, special-status plants, and sensitive natural communities impacts; reduces intensity of other effects due to substantially smaller project footprint. SUM impacts related to transportation hazards and special-status reptiles and amphibians. LSM impacts related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards.

NOTES: LSM = Less than significant impact with mitigation; SUM = Significant and unavoidable impact with mitigation

6.3.1.2 Ability to Meet Project Objectives

The No Project Alternative would fail to meet all of the fundamental objectives of the project for the following reasons:

1. The SFPUC would continue to operate and maintain the Fifield-Cahill ridge trail and associated facilities. The existing docent program and other ongoing watershed initiatives (e.g., the existing Crystal Springs Regional Trail informational brochure) currently foster public awareness around water quality, water supply, ecological, and watershed protection issues. However, the No Project Alternative would not enhance public awareness of these issues above their current level through expanded compatible recreational opportunities within the watershed, which is what the project aims to do. Therefore, the No Project Alternative would not meet this project objective.

2. The SFPUC would continue to operate and maintain the Fifield-Cahill ridge trail and associate facilities, which does provide opportunities to educate the general public about the SFPUC's responsibility as a regional water supplier and owner of the Peninsula Watershed. However, without improved and enhanced facilities to support expanded watershed public visitation, the No Project Alternative would not provide opportunities to educate the public beyond those which currently exist. For example, without the project improvements, the SFPUC would not be able to use project facilities to support educational programming and volunteer-hosted school program visits, based upon the Peninsula Watershed Trail Interpretive Master Plan. Therefore, the No Project Alternative would not meet this project objective.

3. The SFPUC would not construct the southern skyline ridge trail and therefore not meet the project objective to extend the Bay Area Ridge Trail south from S.R. 92 to the Golden Gate National Recreation Area's Phleger Estate. Currently there is not a trail that connects the existing Fifield-Cahill ridge trail, which is part of the Bay Area Ridge Trail, to the Phleger Estate.

4. The SFPUC would not make improvements to the Fifield-Cahill ridge trail and would maintain and operate the trail as under current conditions; therefore, the No Project Alternative would not meet the project objective to improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities.

5. The SFPUC would not construct the southern skyline ridge trail (which would allow multi-modal access to pedestrians, bicyclists, and equestrians). The southern skyline ridge trail would be a key alignment in this area by filling a sizable gap in the existing Bay Area Ridge Trail network. Therefore, the No Project Alternative would not meet the project objective of supporting the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay.

6.3.1.3 Environmental Impacts

The No Project Alternative would avoid all of the impacts identified in Chapter 4, Environmental Setting, Impacts, and Mitigation Measures, for the project. Continued operation and maintenance of the existing Fifield-Cahill ridge trail and associated facilities under the current docent program would have no additional impacts compared to the existing condition.

6.3.2 Alternative B: Relocated Parking Lot and Trailhead South of S.R. 92

6.3.2.1 Description

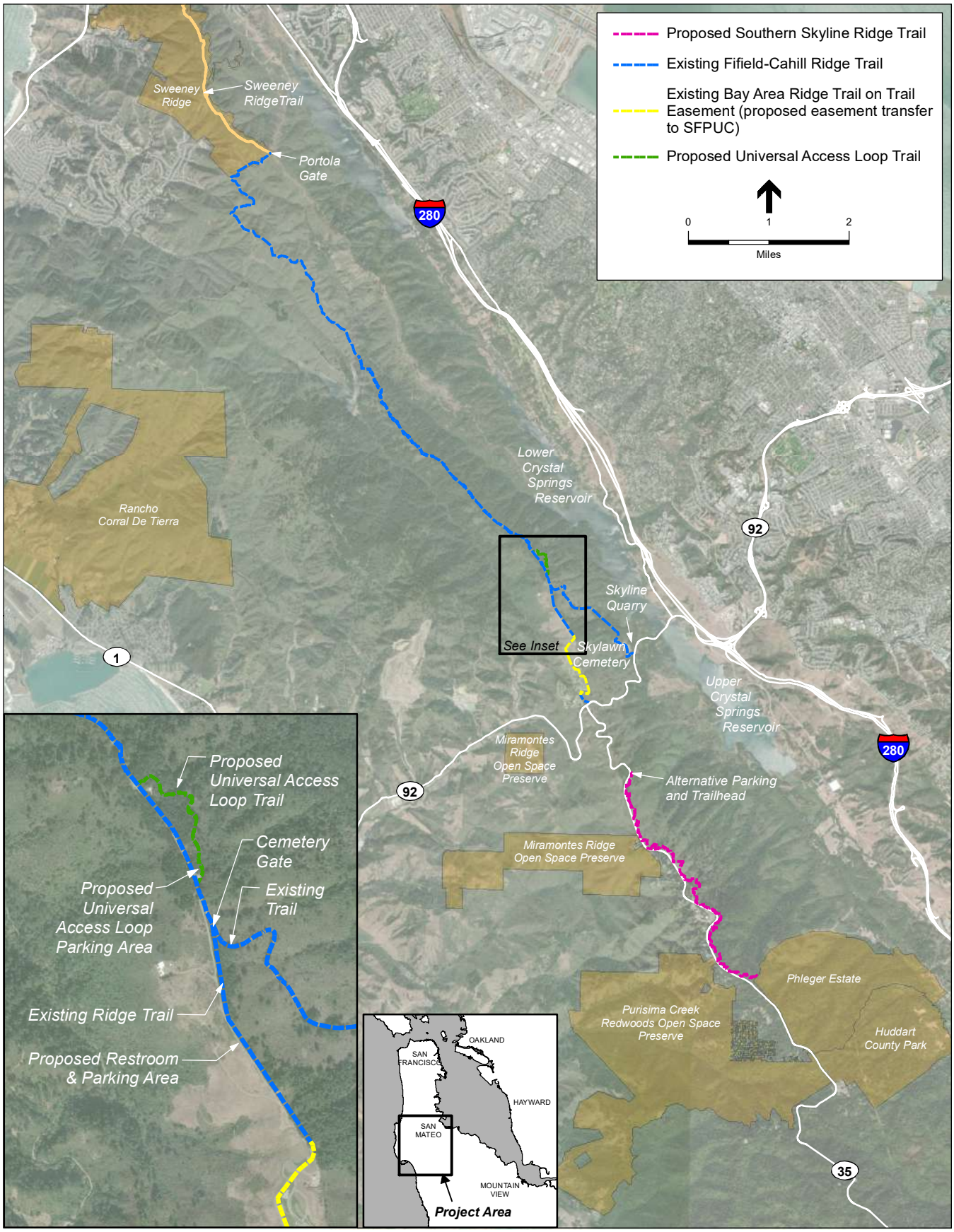
This EIR considers Alternative B because it would address the significant operational transportation hazards impacts related to the potential for unsupervised project visitors to attempt crossing S.R. 92 at its intersection with S.R. 35. This alternative would relocate the parking lot and trailhead for the southern skyline ridge trail from the proposed location at the S.R. 35/S.R. 92 intersection to a new location approximately 1.5 miles south of S.R. 92, near the site of a proposed permanent access drive and temporary construction staging. The parking lot and trailhead would each be the same size and type as described for the project. As also described for the project, this location would be used as a staging area during construction and a maintenance accessway during operation. The trail would begin at this location and extend southward approximately 4.5 miles to the Phleger Estate. The southern skyline ridge trail would not extend north toward S.R. 92.

The approximate location of the Alternative B trailhead and parking area, along with the conceptual trail alignment, is shown in Figure 6-1. This reduced trail alignment would accommodate multi-modal access and inclusion of docent-led, unsupervised/unrestricted, and unsupervised/restricted access. This alternative would not require construction of the prefabricated bridge because the southern skyline ridge trail would begin south of the trail segment that requires a bridge crossing. Along this shorter trail alignment, construction and operation of all other associated facilities would be the same as described in Chapter 2, Project Description, for the project. Because of the similarities in the trail features and the access variants under Alternative B as compared to the project, visitation under this alternative would be similar to that expected for the project. All other project details, including educational programming, would be the same as described for the project.

6.3.2.2 Ability to Meet Project Objectives

Alternative B would fully support project objectives 1, 2, and 4 and would partially meet objectives 3 and 5. This alternative would "enhance public awareness of water quality, water supply, ecological, and watershed protection issues through providing compatible recreational opportunities in the Peninsula Watershed." Under Alternative B, the Fifield-Cahill ridge trail and southern skyline ridge trail improvements would attract new trail users to the watershed, and the trail users would be made aware of such issues via docents, new informational and educational signage, or information obtained via the permit process, depending upon the access program chosen by the SFPUC.

Similarly, for project objective 2, the new/enhanced trails and facilities would provide opportunities for new visitors to become educated "about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including the unique and diverse habitats thereon" via the same methods as described above. Alternative B would include interpretive and educational opportunities along the trail alignment similar to those described for the project,



SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 6-1

Alternative B - Relocated Parking Lot and Trailhead

based on the Peninsula Watershed Trail Interpretive Master Plan (under development). The SFPUC would provide interpretive educational information for recreational trail users as well as SFPUC- and volunteer-hosted school program visits along the improved trail areas.

Project objective 4 would be fully supported because Alternative B would make the same improvements to the Fifield-Cahill ridge trail as the project, including access for people with disabilities, parking, and restroom facilities. As a result, this alternative would meet the project objective to "improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities."

Since Alternative B would not extend south from S.R. 92 but would begin approximately 1.5 miles south of S.R. 92 and continue south to the Phleger Estate, this alternative would not fully meet project objective 3, which is to "extend the Bay Area Ridge Trail south from S.R. 92 to the Golden Gate National Recreation Area's Phleger Estate." However, as Alternative B would add 4.5 miles of ridge trail between existing nearby ridge trail segments to the north and south, and because the 1.5-mile trail gap could be completed in the future when additional funding is available for a designated S.R. 92 crossing, this alternative would partially meet project objective 3. For the same reasons described for project objective 3, and because it would allow multi-modal access (pedestrian, bicycle, and equestrian) on the southern skyline ridge trail, Alternative B would partially meet project objective 5, which is to "support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay."

6.3.2.3 Environmental Impacts

Implementation of Alternative B would eliminate a significant operations impact and decrease the intensity of some of the other significant construction and operations impacts identified for the project.

Construction

Construction impacts of the Alternative B Fifield-Cahill ridge trail improvements would be the same as identified for the project (Impacts CU-1, CU-2, TCR-1, AQ-1, AQ-6, C-AQ-1, BI-1, BI-2, BI-3, BI-7, and HZ-5).

Construction impacts for the Alternative B southern skyline ridge trail related to cultural and tribal cultural resources, noise, air quality, biological resources, and fire hazards would be slightly reduced, relative to those identified for the project (Impacts CU-1, CU-2, TCR-1, NO-1, AQ-1, AQ-6, C-AQ-1, BI-1, BI-2, BI-3, BI-7, and HZ-5). The extent of construction would be slightly reduced for the southern skyline ridge trail, but the key drivers of the above-referenced construction-related impacts would be substantially similar to those identified for the project. For these reasons, the planning department expects that Alternative B would result in similar types of significant impacts as the project and require the same mitigation measures identified for project construction to reduce the impacts of Alternative B construction to less-than-significant levels. However, because the trail under this alternative would not be as long, there would be less

construction-related ground disturbance and, therefore, lower potential for accidental construction-related disturbance of cultural and tribal cultural resources.

Shifting the southern skyline ridge trail parking lot and trailhead south would reduce trail construction noise impacts to sensitive residential receptors. Similarly, because this alternative would not include the prefabricated bridge, the northernmost sensitive residential receptors (located within 200 feet of the prefabricated bridge location under the project) would not be exposed to construction-related noise associated with the prefabricated bridge installation. Notably, relocating the parking lot and trailhead approximately 1,000 linear feet south of the northernmost sensitive residential receptors (11200 Skyline Boulevard) would not result in significant noise impacts from parking lot construction due to the distance from the residential receptor and the intervening vegetation and topography. With a smaller project to construct, Alternative B would require fewer construction hours and less ground disturbance, resulting in reduced emissions relative to the project. Given the reduced trail and fencing construction footprint, Alternative B would have lower potential to harm biological resources, if present, such as special-status plant species, California red-legged frog, dusky-footed woodrat, American badger, special-status and migratory nesting birds, special-status bats, and significant trees. For the same reasons, construction equipment and workers would pose less of a risk of wildland fire from equipment with internal combustion engines, gasoline-powered tools, and other spark-producing equipment.

Operations

The 1.5-mile gap between S.R. 92 and the southern skyline ridge trail relocated trailhead would remove an incentive for visitors of one trail segment to attempt crossing S.R. 92 to reach the opposite segment. Thus, Alternative B would avoid the significant and unavoidable transportation and circulation impacts identified for the project (Impact TR-5). However, because the Fifield-Cahill ridge trail improvements would be the same as the project, Alternative B operations with unsupervised access along the Fifield-Cahill ridge trail could also result in significant and unavoidable impacts on San Francisco garter snake, California red-legged frog, Mission blue butterfly, and San Bruno elfin butterfly (Impact BI-5). Similarly, Alternative B operations with unsupervised access could result in substantial adverse impacts related to the spread of *Phytophthora* pathogens (Impact BI-7).

Operations impacts associated with the Fifield-Cahill ridge trail improvements would be the same as for the project (Impacts CU-3, CU-4, TCR-2, BI-4, BI-5, and HZ-8). However, operations impacts for the southern skyline ridge trail related to cultural and tribal cultural resources, biological resources, fire hazards would be slightly reduced, relative to those identified for the project (Impacts CU-3, CU-4, TCR-2, BI-5, and HZ-8) because with a southern shift in the southern skyline ridge trail parking lot and trailhead and a correspondingly shorter southern skyline ridge trail, visitors would use a smaller portion of the watershed as compared to the project. This would result in reduced potential for inadvertent discovery and damage to archeological resources, human remains, and other cultural resources of tribal cultural significance; a lower likelihood of encountering and harming California red-legged frog and nesting birds and their habitats; and slightly reduced wildfire hazard risk. As explained for Alternative B construction, the key drivers of the above-referenced operations-related impacts

would be substantially similar to those identified for the project. For these reasons, the planning department expects that Alternative B would result in similar types of significant impacts as the project and require the same mitigation measures identified for project operations to reduce the operations impacts of Alternative B to less-than-significant levels.

In summary, the overall intensity of construction and operations impacts would be slightly reduced under Alternative B relative to the project due to relocating southern skyline trailhead and parking area to the south, which would result in a 25 percent reduction in the length of new trail construction, and a 10 percent reduction in overall length of newly accessible trail for the SFPUC to operate and maintain. Alternative B would eliminate the significant and unavoidable transportation hazards impact. However, significant impacts related to San Francisco garter snake, California red-legged frog, Mission blue butterfly, San Bruno elfin butterfly, and spread of *Phytophthora* pathogens would remain. Albeit slightly reduced, all of the significant-but-mitigable impacts would also remain, and the mitigation measures identified for the project would be required to reduce those impacts to less-than-significant levels. This alternative would not meet the project objectives to the same extent as the project.

6.3.3 Alternative C: Pedestrian-Only Trail Access

6.3.3.1 Description

This EIR considers Alternative C because it would address the significant operational impacts related to the potential for unsupervised trail users, specifically bicyclists and equestrians, to harm special-status amphibians and reptiles along the Fifield-Cahill ridge trail. This alternative would limit visitor access on the Fifield-Cahill ridge trail and southern skyline ridge trail to pedestrians only (by eliminating bicycle and equestrian use), while constructing all of the same trail and facility components as the project. Trail facilities would permit alternative modes of transportation, as needed, to accommodate disabled visitor access. Because the alternative would accommodate only pedestrian trail users, new parking facilities would not include equestrian parking.

The pedestrian-only alternative would accommodate docent-led, unsupervised/unrestricted, and unsupervised/restricted access. Construction and operations of all associated facilities would be the same as described in Chapter 2, Project Description, for the project. Due to the similarities in the trail features and potential access program configurations under Alternative C as compared to the project, pedestrian visitation under this alternative would be similar to pedestrian visitor numbers expected with the project. However, overall visitation would be expected to be less under this alternative as compared to the project because of restrictions on bicyclists and equestrians. Similarly, all other project details, including educational programming, would be the same as described for the project.

6.3.3.2 Ability to Meet Project Objectives

Alternative C would fully support project objectives 1, 2, 3, and 4, and would partially meet objective 5. This alternative would "enhance public awareness of water quality, water supply, ecological, and watershed protection issues through providing compatible recreational

opportunities in the Peninsula Watershed." Under Alternative C, the Fifield-Cahill ridge trail and southern skyline ridge trail improvements would attract new trail users to the watershed, and the trail users would be made aware of such issues via docents, new informational and educational signage, or information obtained through the permit process, depending upon the access program that the SFPUC chooses.

Similarly, for project objective 2, the new/enhanced trails and facilities would provide opportunities for new visitors to become educated "about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including the unique and diverse habitats thereon" via the same methods as described above. Alternative C would include interpretive and educational opportunities along the trail alignment similar to those described for the project, based on the Peninsula Watershed Trail Interpretive Master Plan (under development). The SFPUC would provide interpretive educational information for recreational trail users as well as SFPUC- and volunteer-hosted school program visits along the improved trail areas.

Similar to the project, Alternative C would accomplish project objective 3 to extend the Bay Area Ridge Trail from S.R. 92 to the Phleger Estate because the southern skyline ridge trail would be constructed just south of S.R. 92 and extend to the watershed/Phleger Estate boundary. Project objective 4 would be fully supported because this alternative would make the same improvements to the Fifield-Cahill ridge trail as the project, including access for people with disabilities, parking, and restroom facilities. As a result, the alternative would meet the project objective to "improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities."

As a pedestrian-only alternative, Alternative C would only partially meet project objective 5 to "support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, and equestrian) trail that loops the San Francisco Bay." While Alternative C would involve construction of all facilities identified for the project, it would allow only one mode of travel (i.e., pedestrian) on trails in the project area. Therefore, Alternative C would advance the Bay Area Ridge Trail Council's goal of creating a trail that loops the San Francisco Bay, but it would not fully meet the group's aspirations for multi-modal access along ridge trail segments that traverse the watershed.

6.3.3.3 Environmental Impacts

Implementation of Alternative C would eliminate a significant operations impact and decrease the intensity of some of the other significant operations impacts identified for the project.

Construction

Alternative C would include the same components identified for the project. Accordingly, construction impacts of the Alternative C Fifield-Cahill ridge trail and southern skyline ridge trail improvements would be the same as identified for the project (Impacts CU-1, CU-2, NO-1, AQ-1, AQ-6, C-AQ-1, BI-1, BI-2, BI-3, BI-7, HZ-5, and TCR-1). For these reasons, the planning department expects that Alternative C would result in similar types of significant impacts as the

project and require the same mitigation measures identified for project construction to reduce the impacts to less-than-significant levels.

Operations

As a pedestrian-only alternative, Alternative C would reduce impacts to special-status amphibians and reptiles on Fifield-Cahill ridge trail by limiting visitor access to foot travel on project trails, as compared to bicycle and equestrian travel that would be allowed under the project. Alternative C would be protective of special-status amphibians and reptiles because pedestrians would generally be closer to the ground and travel at slower speeds than would bicyclists and equestrians. For these reasons, pedestrians would be better able to detect and avoid special-status amphibians and reptiles that might be traveling or basking on the trail. Similarly, slower travel speeds would provide special-status amphibians and reptiles with more time to move out of harm's way. As a result, Alternative C would avoid harm to special-status amphibians and reptiles from bicyclists and equestrians and reduce this impact to less than significant with mitigation, as compared to significant and unavoidable with multi-modal trail use under the project.

Alternative C would have the same operational impacts as the project related to cultural resources and tribal cultural resources (Impacts CU-3, CU-4, and TCR-2), because ground-disturbing operation and maintenance activities would be similar. Relative to the project, Alternative C would have slightly reduced operational impacts related to transportation and circulation, biological resources, and hazards and hazardous materials (Impacts TR-5, BI-4, BI-5, and HZ-8) due to reduced overall visitation numbers under the pedestrian-only alternative. However, this intensity reduction would not decrease the relative severity of the impacts, as the key impact drivers would be substantially similar. Therefore, the same mitigation measures would be required to reduce Alternative C operational impacts. As with the project, potential effects of Alternative C related to transportation hazards, special-status butterflies, and spread of *Phytophthora* pathogens would remain significant and unavoidable with mitigation.

In summary, construction impacts would be the same under Alternative C as under the project because this alternative would include all the physical elements identified for the project. With visitation limited to pedestrian access only, this alternative would avoid potential effects on San Francisco garter snake and California red-legged frog from bicyclists and equestrians and correspondingly reduce the significant impact on special-status amphibians and reptiles to less than significant with mitigation. However, significant and unavoidable impacts related to transportation hazards, special-status butterflies, and spread of *Phytophthora* pathogens would remain. All of the significant-but-mitigable impacts would also remain, and this alternative would require the mitigation measures identified for the project to reduce those impacts to less-than-significant levels. Alternative C would not meet the project objectives to the same extent as the project.

6.3.4 Alternative D: Alternative Trail Alignment

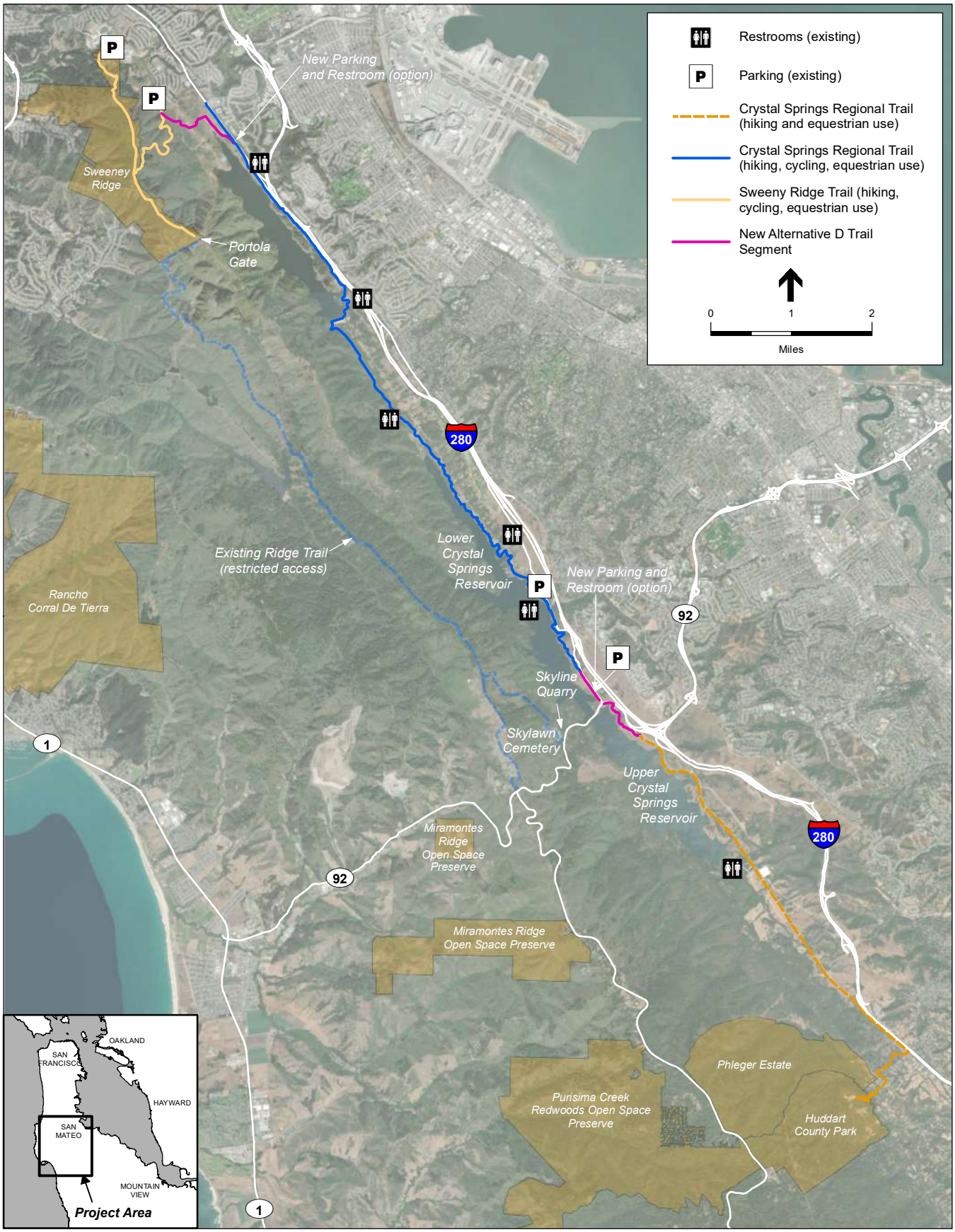
6.3.4.1 Description

This EIR considers Alternative D because it would address the significant and unavoidable operational impacts related to the potential for unsupervised trail users to harm special-status butterflies and their host plants along the Fifield-Cahill ridge trail and to increase the rate of spread for *Phytophthora* pathogens (including sudden oak death). Under Alternative D, there would be no new trail, trailhead, or parking improvements for the Fifield-Cahill ridge trail, nor would there be any modifications to the existing docent-led access program. Similarly, under this alternative, the SFPUC would not construct a universal access loop trail or southern skyline ridge trail, nor would it install any associated parking or restroom facilities to support such trails. Instead, Alternative D includes an alternative trail alignment that would provide improved trail access between Sweeney Ridge and the Phleger Estate via the existing Crystal Springs Regional Trail and Huddart County Park trail system, as shown in Figure 6-2.

To facilitate the alternate route and connection to existing trails, Alternative D would construct new trails in two separate areas. In the northern portion of this alternative project area, the SFPUC would repurpose an approximately 1.2-mile segment of existing, paved watershed maintenance road as a multi-modal connector between existing trails to the east and west. This segment, which is currently closed to the public, would provide public access between the Sweeney Ridge Trail near (0.2 mile south of) the Sneath Lane parking lot and the Crystal Springs Regional Trail's San Andreas segment near (0.5 mile south of) San Bruno Avenue. In the middle portion of the alternative project area, the SFPUC would construct approximately 1.3 miles of new, multi-use trail. The latter trail improvements would extend south from the southern terminus of the Crystal Springs Regional Trail's existing Sawyer Camp segment near (0.4 mile south of) Bunker Hill Road, and north from the northern terminus of the regional trail's existing Crystal Springs segment at the S.R. 92/Cañada Road intersection. The new trail segments would extend to the S.R. 35/S.R. 92 intersection.

The San Andreas segment of the Crystal Springs Regional Trail is an approximately 7-mile-long pathway that extends south from San Bruno Avenue in the north to its connection with Sawyer Camp segment in the south. Most of the trail is paved and provides access to pedestrians, bicyclists, and equestrians; however, the southerly 0.7 mile is gravel surface and not passable by bicycles, which must detour to the adjacent S.R. 35. The Sawyer Camp segment is an approximately 6-mile, paved pathway that provides access to pedestrians, bicyclists, and equestrians between the San Andreas segment in the north and its southern terminus near (0.5 mile north of) the S.R. 35/S.R. 92 intersection. The Crystal Springs segment is an approximately 6.8-mile, mostly-unpaved trail that extends from the S.R. 92/Cañada Road intersection in the north to Huddart Park in the south. The Crystal Springs segment provides access to pedestrians and equestrians, but not bicyclists. However, on most Sundays a 2.5-mile segment of Cañada Road, which parallels the trail between S.R. 92 and Edgewood Road, is closed to vehicles but remains open for use by bicyclists and others.[2] The Huddart Park trail system includes a segment of the Bay Area Ridge Trail and connects to the Phleger Estate trail system.

[2] County of San Mateo Parks Department, *Crystal Springs Regional Trail – Crystal Springs Segment*, https://parks.smcgov.org/crystal-springs-segment, accessed January 22, 2018.



SOURCE: ESRI; ESA

Southern Skyline Boulevard Ridge Trail Extension

Figure 6-2

Alternative D - Alternative Trail Alignment

Under Alternative D, the 1.2-mile connector trail (converted from existing SFPUC maintenance roads) between Sweeney Ridge and the Crystal Springs Regional Trail would be enclosed in barbed-wire fencing, similar to the fencing described for the project. Because this road segment is currently paved, no surface improvements would be required.

The new 1.3 miles of trail near S.R. 92 would consist of 6-foot-wide aggregate-base trail, similar to that described for the project's southern skyline ridge trail. North of S.R. 92, the subject trail alignment is bounded to the west by chain-link fencing, as are some portions to the south. Under Alternative D, the SFPUC would install bollards or new separation fencing along the east side of the alignment to provide a protective barrier between trail users and adjacent vehicular roadway traffic; south of S.R. 92, the SFPUC would add more barbed-wire fencing, similar to that which presently exists in the area, along the west side of the trail for public health and safety.

Under Alternative D, the SFPUC would formalize and expand two existing unimproved or degraded turnouts that are currently used as informal parking areas by visitors to the Crystal Springs Regional Trail. These could include turnouts along S.R. 35, approximately 0.5 mile south of San Bruno Avenue West (outside the northernmost existing watershed entrance gate) and at the S.R. 92/S.R. 35 intersection. At each turnout location, improvements would include a paved and striped parking lot capable of accommodating between 10 to 20 vehicles and a vault restroom similar to those described for the project.

With the improved trail access between Sweeney Ridge and Huddart Park, and with improved parking and expanded restroom access, visitation under Alternative D would likely increase over baseline conditions. Because Alternative D would use a substantial amount of existing trail, that currently receives approximately 400,000 visitors per year,[3] the increase in visitation among new Alternative D trail segments would be considerably greater than for the project.

Alternative D would allow multi-modal (pedestrian, bicyclist, and equestrian) access on the connector trail between Sweeney Ridge and the Crystal Springs Regional Trail, and along the trail between the Sawyer Camp segment and Crystal Springs segment. The existing access modes described above for the Crystal Springs Regional Trail would not change, nor would those for the Huddart County Park trail system, which also allows pedestrian and equestrian access on some trails and pedestrian-only access on others. Visitor access along the 1.2-mile connector trail would be the same as described for the project (e.g., could range from docent-led access to unsupervised/unrestricted), during daylight hours. Visitor access along the 1.3 miles of new trail would be consistent with that of the adjacent existing Crystal Springs Regional Trail segments (i.e., unsupervised/unrestricted access) during daylight hours.

Alternative D would include interpretive/educational signage and educational programs along the new trail segments described in this alternative, including new interpretive signage on

[3] Wright, Katherine, Interpretive Park Ranger, San Mateo County Parks Department, email communication to Elijah Davidian, Environmental Science Associates, re: FY 2015-16 Visitation Estimates for Sawyer Camp Trail, July 12, 2017. This document (and all other documents cited in this report, unless otherwise noted) is on file for public review at the Planning Department, 1650 Mission Street, Suite 400, as part of Case File No. 96.222E.

Crystal Springs Regional Trail, based on the Peninsula Watershed Trail Interpretive Master Plan (under development).

6.3.4.2 Ability to Meet Project Objectives

Alternative D would support project objectives 1 and 2 and would partially meet objective 5. This alternative would not meet project objectives 3 and 4.

This alternative would "enhance public awareness of water quality, water supply, ecological, and watershed protection issues by providing compatible recreational opportunities in the Peninsula Watershed." Under Alternative D, the new trail connections and improved visitor access (e.g., parking and restrooms) would attract new trail users to the watershed. These new trail users would be made aware of such issues via new informational and educational signage; an existing Crystal Springs Regional Trail informational brochure available at trail kiosks and online; and, potentially, through information obtained via docents or the permit process, depending upon the access program chosen by the SFPUC for the Sweeney Ridge-Crystal Springs Regional Trail connector.

Similarly, for project objective 2, the new/enhanced trail connections and facilities would provide opportunities for new visitors to become educated "about the SFPUC's responsibilities as a regional water supplier and owner of the Peninsula Watershed, including the unique and diverse habitats thereon." Alternative D would include interpretive and educational opportunities along the trail alignment similar to those described for the project, based on the Peninsula Watershed Trail Interpretive Master Plan (under development), including interpretive educational information for recreational trail users and SFPUC- and volunteer-hosted school program visits along the improved trail areas.

With regards to project objective 3, similar to the No Project Alternative, the SFPUC would not construct the southern skyline ridge trail; therefore, this alternative would not meet the objective to extend the Bay Area Ridge Trail south from S.R. 92 to the Phleger Estate. Similarly, under Alternative D, there would be no trail, trailhead, or parking improvements to the Fifield-Cahill ridge trail, and a universal access loop trail would not be built. As a result, this alternative would not meet project objective 4, which is to "improve the existing Fifield-Cahill ridge trail to enhance access (including access for people with disabilities), parking, and restroom facilities."

Alternative D would partially meet project objective 5, which is to "support the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal (pedestrian, bicycle, equestrian) trail that loops the San Francisco Bay." This alternative would provide a connector trail between Sweeney Ridge and Crystal Springs Regional Trail and extend existing segments of the Crystal Springs Regional Trail near S.R. 92, thus providing greater connectivity between Sweeney Ridge and Huddart Park, both of which contain segments of the Bay Area Ridge Trail. However, the trail alignment under Alternative D would not connect with the Fifield-Cahill ridge trail (part of the Bay Area Ridge Trail), and the Bay Area Ridge Trail would continue to be disjointed in this area. In addition, while pedestrians, bicyclists, and equestrians would be accommodated along

much of the Alternative D trail alignment, access to the Crystal Springs segment would continue to be limited to pedestrians and equestrians, and bicycling would still be prohibited.

6.3.4.3 Environmental Impacts

Implementation of Alternative D would substantially reduce significant operations impacts related to disturbance of Mission blue butterfly and San Bruno elfin butterfly and spread of infectious plant pathogens, and decrease the intensity of some of the other significant construction and operations impacts identified for the project. However, Alternative D construction and operations could also result in similar or increased impacts on other special-status species and sensitive natural areas within the alternative trail alignment areas.

Construction

While no surface improvements would be required for the 1.2-mile Sweeney Ridge-Crystal Springs Regional Trail connection, the SFPUC would install new barbed-wire fencing and interpretive signage along the existing service road. Fencing installation methods and equipment would be similar to that described for the project, involving hand or mechanized vegetation trimming where necessary, line post and t-post installation, and wire stringing. The SFPUC would install the new 1.3 miles of aggregate-base trail and fencing near S.R. 92, as well as the parking and restroom improvements, in a manner and with equipment similar to that described for the southern skyline ridge trail. Construction of these components would likely involve clearing, grubbing, tree removal and/or felling, grading, excavation, and compaction; limited paving; and installing restrooms, signage, fencing, and bollards or similar barriers to separate the trail from adjacent roadway.

Although the Alternative D trail alignment would require less ground disturbance than the project, the new trail connector areas contain sensitive biological resources. The 1.2-mile Sweeney Ridge-Crystal Springs Regional Trail connection passes through habitat for California red-legged frog and Mission blue butterfly, and due to its reservoir proximity has a higher concentration of San Francisco garter snake than the project area. This 1.2-mile segment is also adjacent to bioregional habitat restoration sites and associated conservation easements, which provide mitigation for water system improvement projects.[4]

The 1.3-mile connector trail near S.R. 92 also includes habitat for California red-legged frog and San Francisco garter snake due to its close proximity to the reservoirs. This segment contains potential habitat for two special-status plant species with low potential for occurrence in the project area, including Crystal Springs fountain thistle (*Cirsium fontinale var. fontinale*), a federal and state listed endangered plant known only from the vicinity of Crystal Springs Reservoir, and

[4] Bioregional habitat restoration is an SFPUC initiative in which the mitigation requirements of several water supply improvements projects are combined and implemented through a suite of habitat improvement projects within the Peninsula and Alameda Creek watersheds. On the Peninsula Watershed, the SFPUC's bioregional habitat restoration initiative has restored native habitat for California red-legged frog, wetlands along Upper Crystal Springs and San Andreas reservoirs, as well as oak woodlands and grassland. Additional information is available on the program's website at https://sfwater.org/index.aspx?page=1032.

Marin western flax (*Hesperolinon congestum*), a federal and state listed threatened plant. [5] This area also contains potential habitat for various unlisted rare plants, such as Crystal Springs lessingia (*Lessingia arachnoidea*), and includes sensitive natural communities such as serpentine grasslands, serpentine seeps, and coast live oak woodlands. Additionally, this connector trail would pass through areas containing bioregional habitat restoration sites and associated conservation easements.

Alternative D construction impacts related to special-status species and sensitive natural communities would be similar or increased relative to those identified for the project (Impacts BI-1, BI-2, and BI-3). Due to their proximity to sensitive habitat areas, Alternative D construction activities could have significant direct and indirect effects on the above-listed special-status species and sensitive natural communities. For the same reasons described for the project, with similar design modifications and implementation of the relevant project mitigation measures the impacts of the alternative could be reduced to less-than-significant levels.

Other biological resource construction impacts would be similar or reduced under Alternative D. For example, Mission blue butterfly habitat occurs along the Alternative D Sweeney Ridge-Crystal Springs Regional Trail connection alignment and could be adversely affected during fence installation. The potential for adverse effects on this habitat type would be less than for the project due to the smaller Alternative D construction footprint. (Impact BI-2). For the same reason, Alternative D would have lower potential to harm other sensitive biological resources, if present, such as dusky-footed woodrat, American badger, special-status and migratory nesting birds, special-status bats (Impact BI-2). Similarly, due to the smaller Alternative D footprint, construction-related impacts associated with spread of invasive plant species and spread of plant pathogens would also be reduced (Impact BI-7).

Similarly, due to its smaller scale relative to the project, Alternative D would also result in less extensive cultural and tribal cultural resources, noise, air quality, and hazards construction impacts (Impacts CU-1, CU-2, TCR-1, NO-1, AQ-1, AQ-6, C-AQ-1, and HZ-5). Alternative D would require considerably fewer construction hours and less ground disturbance, thus resulting in reduced emissions relative to the project. Because this alternative would require fewer pieces of loud equipment located farther from sensitive receptors than the project, it would also reduce significant noise impacts. Additionally, construction equipment and workers under Alternative D would pose less of a risk of wildland fire from equipment with internal combustion engines, gasoline-powered tools, and other spark-producing equipment than the project. While reduced in extent, the key drivers of Alternative D impacts would be largely similar to those identified for the project. For these reasons, the planning department expects that Alternative D would result in similar types of significant cultural and tribal cultural resources, noise, air quality, and hazards construction impacts as the project, and require similar mitigation measures to reduce the Alternative D construction impacts to less-than-significant levels.

[5] California Native Plant Society, *Rare Plant Program. Inventory of Rare and Endangered Plants of California* (online edition, v8-03 0.39), *http://www.rareplants.cnps.org*, accessed August 20 to 22, 2019.

Operations

Compared to the project, Alternative D would substantially reduce the potential for significant operations impacts related to disturbance of special-status butterflies and spread of infectious plant pathogens. The SFPUC would provide new visitor access between Sweeney Ridge and the Crystal Springs Regional Trail (1.2-mile connector trail) and between the Sawyer Camp segment and Crystal Springs segment of the Crystal Springs Regional Trail (1.3 miles of new trail). In the 1.3 miles of new trail area, biologists have not documented host plants for special-status butterfly species in annual watershed-wide surveys.[6] Regarding the 1.2-mile connector trail, biologists have documented host plants for special-status butterflies in the area, but these plants and butterflies are not as prevalent as in the Fifield-Cahill ridge trail segment of the project alignment.[7] Moreover, because the 1.2-mile connector trail is currently paved, there would be no host plants in the trail alignment and more visitors using the trail compared to the project would not increase the risk of trampling host plants or butterflies; however, a small potential for off-trail use to affect host plants between the trail and fence line would remain. Therefore, under Alternative D, increased use of the 1.2-mile connector trail and new visitation to the 1.3-mile segment near S.R. 92 would substantially reduce the significant and unavoidable impact on special-status butterflies identified for the project (Impact BI-5).

Similarly, Alternative D would have a substantially reduced potential relative to the project for accelerated spread of *Phytophthora* pathogens. The extent of pathogens near the Alternative D alignment is not well understood. These pathogens might exist along portions of Sweeney Ridge Trail and/or Crystal Springs Regional Trail. However, the Alternative D connector trails would not provide conditions favorable to hosting or transmitting such pathogens. For example, if visitors approaching from the unpaved Sweeney Ridge Trail to the north came in contact with infected dirt, mud, or water, transmission to other areas of the Alternative D trail alignment would be unlikely because the 1.2-mile connector trail and the adjoining San Andreas trail together comprise approximately 7 miles of continuous paved trail without conditions favorable to hosting or transmitting such pathogens. With respect to the 1.3 miles of new trail near S.R. 92, the likelihood of accelerated pathogen spread would be similarly unlikely because the new segment would be constructed mainly through near-highway ruderal grassland; the few wooded areas through which the trail could pass are isolated and confined to areas west of S.R. 35 and Half-Moon Bay Road and east of the Upper and Lower Crystal Springs reservoirs. Further, the new trail improvements would be bounded to the north by the 6-mile, paved Sawyer Camp Trail. Thus, even if visitors approaching from the unpaved Crystal Springs segment to the south came into contact with infected dirt, mud, or water, opportunities to transmit pathogens would be few and, if successful, would be limited in extent of effect to isolated clusters of woodlands between the road and the reservoirs. For these reasons, compared to the project, Alternative D would reduce the significant impact related to accelerated spread of plant pathogens to less-than-significant with mitigation (Impact BI-7).

6 Arnold, Richard A., *Monitoring Report for the Endangered San Bruno Elfin and Mission Blue Butterflies at the San Francisco Peninsula Watershed*, prepared for San Francisco Public Utilities Commission, December 2016.

7 Ibid.

As discussed in Section 4.8, Biological Resources, biologists detected San Francisco garter snake and California red-legged frog in Upper and Lower Crystal Springs reservoirs.[8] While Alternative D would locate the new trail segments in upland areas to the extent possible, outside of preferred habitat for these species, San Francisco garter snake and California red-legged frog are known to occur in and pass through these areas. As explained for the project, with new or substantially increased visitation along trails near primary habitat areas (e.g., Upper and Lower Crystal Springs reservoirs), there is potential for direct impacts (e.g., trampling and crushing) on these special-status reptiles and amphibians. Mitigation measures similar to those recommended for the project would reduce the potential for such impacts. However, with unsupervised, high-volume access along such trails, the SFPUC could not assure there would be full adherence to these measures. As a result, under Alternative D, the potential for adverse effects on San Francisco garter snake and California red-legged frog would remain significant and unavoidable with mitigation (Impact BI-5).

Alternative D operation might also result in adverse effects on two special-status plant species. Potential habitat for Crystal Springs fountain thistle (a federal and state-listed endangered species unique to Crystal Springs Reservoir) and Marin western flax (a federal and state-listed threatened species) occurs in the 1.3-mile alternative trail corridor alignment between the Sawyer Camp and Crystal Springs segments. These plants, which have low potential to occur in the project area, are threatened by development, foot traffic, non-native plants, dumping, and hydrological alterations.[9] New or substantially increased visitation along trails near primary habitat areas creates the potential for direct impacts (e.g., trampling, crushing, spread of non-native plants) on these special-status plant species, if present, which would be a significant and adverse impact that would not be expected under the project (Impact BI-4).

In terms of transportation impacts, the 1.3 miles of new trail between the Sawyer Camp segment and the Crystal Springs segment would extend to and terminate at S.R. 92, where there currently is no designated crossing. New trail segments immediately north and south of S.R. 92, could entice some trail users to cross S.R. 92 to access the opposite trail segment. While traffic controls do exist at this intersection, and sight distances are generally better than for the S.R. 92/S.R. 35 south intersection, there are currently no designated crossings of S.R. 35 or S.R. 92 at this location. Just as the project would not establish a designated crossing of S.R. 92, Alternative D would not either. As a result, implementation of Alternative D would result in a significant transportation hazard impact resulting from trail users attempting to cross S.R. 92 where no designated crossing exists. Given the relatively improved sight distances and intersection signalization in the Alternative D alignment area, the S.R. 92 crossing hazard would be somewhat less than for the project, but would remain significant and unavoidable due to the absence of a designated crossing. Mitigation calling for implementation of a feasible crossing solution at this location (signal, roundabout, or bridge) would reduce this impact. However, the California Department of Transportation (Caltrans) has primary jurisdiction because the crossing would involve a state

[8] California Department of Fish and Wildlife, California Natural Diversity Database, *Rarefind 5 printout and GIS database for animals for the Montara Mountain, San Mateo, Woodside, San Francisco South, Hunters Point, Redwood Point, Palo Alto, Half Moon Bay, San Gregorio, La Honda and Mindego Hill 7.5 minute topographic quadrangles*, accessed January 12, 2017.

[9] California Native Plant Society, *Rare Plant Program, Inventory of Rare and Endangered Plants of California* (online edition, v8-03 0.39), *http://www.rareplants.cnps.org*, accessed August 20 to 22, 2019.

highway; therefore, adding a safe crossing would be beyond the control of the SFPUC. As a result, implementation of the crossing mitigation measure could not be assured (e.g., if not approved by Caltrans), and the impact would remain significant and unavoidable with mitigation (Impact TR-5).

Other Alternative D operational impacts related to cultural and tribal cultural resources, and fire hazards would be substantially reduced relative to those identified for the project (Impacts CU-3, CU-4, TCR-2, and HZ-8). With a smaller amount of new/modified trail required for Alternative D, the currently restricted or undeveloped areas of the watershed to which the public would gain access would also be substantially reduced relative to the project. This would result in reduced potential for inadvertent discovery and damage to archeological resources, human remains, and other cultural resources of tribal cultural significance and reduced wildfire hazard risk. As explained for Alternative B construction, the key drivers of the above-referenced operations-related impacts would be substantially similar to those identified for the project. For these reasons, the planning department expects that Alternative D would result in similar types of significant impacts as the project and require mitigation measures similar to those identified for project operations to reduce Alternative D operation impacts to less-than-significant levels.

The project would likely increase visitation to Sweeney Ridge, Crystal Springs Regional Trail, and Huddart Park, which in turn would increase the operations and maintenance burden along these trails (e.g., trail wear, trash pickup, restroom maintenance). However, Alternative D would use a large amount of existing, highly used trail, and the amount of new trail requiring maintenance would be small relative to the project. In addition, the Alternative D trail, parking, and restroom facilities that would likely offset some of the potential visitor use effects on the existing trail and visitor amenities. For these reasons, the planning department does not expect that this alternative would have substantial adverse effects on existing recreational facilities (such as deteriorating or degrading the facilities) whose repair or expansion would result in a significant environmental effect.

In summary, relative to the project, Alternative D would substantially reduce the significant Mission blue butterfly, San Bruno elfin butterfly, and spread of *Phytophthora* pathogens impacts. However, potential significant and unavoidable impacts related to San Francisco garter snake and California red-legged frog would likely increase, and this alternative could cause additional significant impacts on Crystal Springs fountain thistle, Marin western flax, sensitive natural communities, and bioregional habitat restoration sites. The transportation hazard associated with crossing S.R. 92 would remain significant and unavoidable with mitigation, although the hazard would be somewhat reduced under this alternative due to better sight distances and a signalized intersection. The overall intensity of construction and operational impacts associated with cultural and tribal cultural resources, noise, air quality, and fire hazards would be reduced because this alternative would include less parking, less fencing, fewer restrooms, an 80 percent reduction in the length of new trail construction, and a 96 percent reduction in overall length of newly accessible watershed trails to be operated and maintained. With the exception of noise, all of the significant-but-mitigable impacts would remain, and this alternative would require mitigation measures similar to those identified for the project to reduce those impacts to less-than-significant levels. Alternative D would not meet the project objectives to the same extent as the project.

6.4 Alternatives Comparison and the Environmentally Superior Alternative

The CEQA Guidelines require the identification of an environmentally superior alternative among the alternatives (CEQA Guidelines section 15126.6[e]). If it is determined that the "no project" alternative would be the environmentally superior alternative, then the EIR shall also identify an environmentally superior alternative among the other project alternatives (CEQA Guidelines section 15126.6[e][2]).

6.4.1 Construction

Construction impacts would be the same under Alternative C relative to the project because this alternative would involve construction of all the components described for the project. Alternatives A, B, and D would reduce construction impacts relative to the project, because (1) Alternative A would involve no new construction; (2) Alternative B would reduce length of new trail construction by 25 percent; and (3) Alternative D would involve less parking, less fencing, and fewer restrooms and would reduce the length of new trail construction by 80 percent. Therefore, Alternative A construction would result in no significant impacts and require no mitigation. Relative to the project, Alternative B would result in reduced severity of significant impacts due to a 1.5-mile reduction in the length of the southern skyline ridge trail. The main impact drivers would be the same as the project, the same types of impacts would remain significant, and Alternative B would require the same types of mitigations to reduce those impacts.

Alternative D construction would result in substantially reduced construction-related impacts on cultural and tribal cultural resources, noise, air quality and hazards. However, Alternative D could result in greater impacts on special-status plants, including impacts on endangered and threatened plant species not expected to occur in the project area. Alternative D would have similar or increased impacts as the project on special-status amphibians and reptiles, and on sensitive natural communities. However, as with Alternative B, because many of the impact drivers would be the same, similar types of impacts would remain, and Alternative D would require similar types of mitigation to reduce those impacts.

6.4.2 Operations

Alternative A would avoid operational impacts because the SFPUC would not implement the project. Relative to the project, alternatives B and C would reduce operational impacts to a similar degree. By removing an incentive for visitors to cross S.R. 92 where no designated crossing exists, Alternative B would avoid a significant and unavoidable transportation hazard impact identified for the project. Under Alternative B, significant impacts related to special-status amphibians, reptiles, and butterflies, as well as spread of plant pathogens, would remain.

Similarly, by limiting trail access to pedestrians only and eliminating the potential for bicyclists and equestrians to harm San Francisco garter snake and California red-legged frog, Alternative C would avoid a significant and unavoidable special-status amphibian and reptile impact.

However, under Alternative C, significant impacts related to transportation hazards, special-status butterflies, as well as spread of plant pathogens, would remain.

By realigning the trail and providing new access along smaller trail segments near paved trails and roadways, Alternative D would substantially reduce significant and unavoidable impacts related to loss of special-status butterfly host plants and individuals, and spread of plant pathogens. However, new trail segments under Alternative D, would pass through sensitive biological habitat. Under Alternative D, significant impacts related to special-status plant species, special-status amphibians and reptiles, as well as transportation hazards would remain. Compared to the project, reductions in other operational impacts would be commensurate with the respective reductions in project footprint and restrictions in access mode across the alternatives, with slight reductions under Alternatives B and C, and greater reductions under Alternative D. However, as noted, because the key drivers of these impacts would be substantially similar, the same types of impacts would likely remain and require similar mitigations.

Ability to Meet Project Objectives

Alternative A would not meet any of the project objectives because this Alternative would not implement the project. Alternative D would meet project objectives to some extent, Alternative B would meet project objectives to a greater extent, and Alternative C would meet project objectives to the greatest extent relative to the project. Alternative B would meet the project objectives of increased public education and enhanced public awareness of the SFPUC's responsibilities as a water provider and local watershed issues through compatible recreational opportunities (objectives 1 and 2), and improving the existing Fifield-Cahill ridge trail (objective 4). However, because this alternative would result in a 1.5-mile trail gap between S.R. 92 and the trailhead to the south, Alternative B would only partially meet the project objectives of extending the Bay Area Ridge Trail south from S.R. 92 and supporting the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal trail around San Francisco Bay (objectives 3 and 5). Alternative C would meet project objectives 1, 2, 3, and 4. However, as mode of access under this alternative would be restricted to pedestrians only, Alternative C would only partially meet project objective 5. Alternative D would meet project objectives 1 and 2, and would partially meet project objective 5 of supporting the Bay Area Ridge Trail Council's goal of creating a continuous multi-modal trail around San Francisco Bay. Alternative D would not meet project objectives 3 and 4, because the alternative does not proposed improvements to the Fifield-Cahill ridge trail or to provide a connection between the Fifield-Cahill ridge trail and the Phleger Estate.

In summary, based on the evaluation above, Alternative B is the environmentally superior alternative among the project alternatives (other than the No Project Alternative). Alternatives D would avoid a significant project impact, but could also result in new or greater significant impacts. Alternative C would similarly avoid a significant project impact and would not result in new or greater significant impacts. However, Alternative B would have the greatest impact reduction because it would avoid a significant traffic hazard impact, and have a greater reduction in significant-but-mitigable impacts. Alternative B also meets most of the project objectives.

6.5 Alternatives Considered but Eliminated from Further Analysis

In developing the project, the SFPUC identified and analyzed a number of project concepts and locations; some were incorporated into the project and others were considered but eliminated from further analysis. The planning department reviewed the initial project concepts and locations as potential strategies for reducing or avoiding the significant adverse impacts identified for the project. In some cases, the SFPUC designed the project to incorporate these strategies. For example, as discussed in Chapter 2, Project Description (Section 2.6.5, Avoidance of Wetlands and Bridge Installation), the SFPUC designed the project's trail alignment to avoid wetlands impacts. Similarly, the SFPUC developed the project's fencing installation approach to minimize the use of mechanized equipment and reduce the width of vegetation clearing for installing barbed-wire fencing, as discussed in Section 2.6.6, Fence Installation. However, among these initial project concepts and the concepts presented by the public during the scoping period, preliminary analysis by the EIR's authors determined two such concepts would result in the same or more severe environmental impacts compared to the project. The concepts considered but eliminated from further analysis are described below in the following sections.

6.5.1 Relocated Trailhead and Parking Lot North of S.R. 92

To eliminate the significant and unavoidable impact related to transportation hazards at the S.R. 35/S.R. 92 intersection, during the scoping period a commenter requested and the planning department considered an alternative concept that would make Skyline Quarry the primary Fifield-Cahill ridge trail access point, as opposed to Cemetery Gate under the project. This alternative concept would have relocated the primary trailhead and parking area for Fifield-Cahill ridge trail approximately 1.25 miles east to Skyline Quarry (see Figure 2-2, Project Overview and Regional Setting, in Chapter 2, Project Description). Cemetery Gate access would be restricted to disabled visitors and authorized personnel. The project's 50-car parking lot at Cemetery Gate would not be constructed. Under this alternative concept, all other project components, along with the range of potential visitor access programs, would be as described for the project (i.e., ranging from docent-led to unsupervised/unrestricted).

For the same reasons described for Alternative B, this concept would meet project objectives 1, 2, 3, and 4, but would only partially meet objective 5 (due to the 1.25-mile trail gap along S.R. 92, between trailheads at Skyline Quarry and S.R. 35).

As noted above, project implementation could result in significant and unavoidable impacts related to transportation hazards at the S.R. 35/S.R. 92 intersection. Shifting the location of the trailhead/parking lot proposed near Cemetery Gate (north of S.R. 92) to Skyline Quarry, and not constructing a new 50-car parking lot near Cemetery Gate, would reduce the incentive for visitors to attempt crossing S.R. 92 where no designated crossing exists. Trail users attempting to reach the segment of trail opposite S.R. 92 would be required to travel more than a mile along a segment of this busy highway, which has no sidewalk, a very narrow shoulder in the westbound direction, and narrow to no shoulder in the eastbound direction. In addition, in the vicinity of Skyline Quarry, S.R. 92 is a narrow, two-lane road with high traffic volumes. Unlike the segment

of S.R. 92 near Cahill Ridge Road (used to access Cemetery Gate), which has broad shoulders, turn lanes, and is somewhat level, the segment of S.R. 92 near Quarry Road (used to access Skyline Quarry) is curved, sloped, has no shoulder on one side, and lacks a turn lane. Therefore, visitors attempting to access the Skyline Quarry parking area and trailhead by vehicle would present new *entrance/exit* conflicts with existing S.R. 92 traffic patterns because of incompatible roadway design, which would present new, significant traffic hazards. Accordingly, this alternative concept would require mitigation to reduce these hazards, and it remains unclear whether feasible mitigation exists. Because Caltrans has primary jurisdiction over S.R. 92 as a state highway, mitigation measure implementation would be beyond the control of the SFPUC. Therefore, the SFPUC could not assure mitigation could be implemented, and the impact would remain significant and unavoidable with mitigation.

Construction and operation of this alternative concept would result in the same or substantially similar types of other impacts identified for the project, including the significant and unavoidable impacts related to special-status reptile and amphibian species, loss of butterfly host plants, and spread of plant pathogens. This concept would require the same mitigation measures as the project.

While this concept would meet most of the project objectives, it would not avoid or substantially lessen the significant effects of the project. Therefore, the planning department rejected this concept and it is not analyzed further in this EIR.

6.5.2 Fifield-Cahill Ridge Trail Realignment

To eliminate the significant and unavoidable impact of trampling or crushing special-status butterflies or their habitat, which is found in and along the existing Fifield-Cahill ridge trail, the planning department considered an alternative concept that would reroute the Fifield-Cahill ridge trail to avoid areas of the trail with host plants. Under this alternative concept, the SFPUC would identify locations along the Fifield-Cahill ridge trail where host plants could be trampled by visitors. The SFPUC would construct new bypass trail segments around these plants and decommission the bypassed segment. The new bypass segments would be similar in character to the existing trail (e.g., its composition, compaction, and width). Under this alternative concept, all other project components, along with the range of potential visitor access programs, would be as described for the project (i.e., ranging from docent-led to unsupervised/unrestricted).

Because this alternative concept's components would be essentially the same as with the project, this concept would meet all project objectives.

This alternative concept would temporarily avoid significant impacts on host plants for special-status butterflies, but over the long-term the potential for this impact would remain significant. Lupine species prefer disturbed habitat, including areas subject to periodic mowing, along trail edges, and between tire tracks, as on the Fifield-Cahill ridge trail. As a result, their preferred habitat condition puts these lupine species in direct conflict with trail users. Rerouting the trail around host plants would avoid the potential for direct effects on the plants within the abandoned trail segment. However, moving the trail would reduce the amount of disturbance in

these areas, which could diminish the habitat value for lupine. Over time, the abandoned trail segments would become revegetated and existing lupine species would likely be outcompeted by plants more adapted to such less-disturbed areas. For this reason, the trail realignment could result in the inadvertent loss of existing habitat for special-status butterflies and, by extension, individual animals. Thus, the impact would remain significant and unavoidable with mitigation. Construction and operation of this alternative concept would result in the same or substantially similar types of other impacts identified for the project, including the significant and unavoidable impacts related to special-status reptile and amphibian species, spread of plant pathogens, and transportation hazards. However, many of these impacts would be increased over the project impacts because this concept would require additional work for the bypass trails along Fifield-Cahill ridge trail. The same mitigation measures would be required.

While this concept would meet all of the project objectives, it would not avoid or substantially lessen the significant effects of the project. As a result, this concept was rejected and is not analyzed further in this document.

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CHAPTER 7
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- Jack Hutchison and Shadde Rosenblum (Transportation and Circulation)
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REQUEST FOR FINAL ENVIRONMENTAL IMPACT REPORT

Southern Skyline Ridge Trail Extension, Planning Department Case No. 2016-016100ENV

Check one box: ☐ Please send me a copy of the Final EIR on USB.
☐ Please send me a paper copy of the Final EIR.

Signed: _____

Name: _____

Street: _____

City: _____ State: _____ Zip: _____